Techno-Choreography and the Embodiment of Chineseness

A thesis submitted for the degree of Doctor of Philosophy

by

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Abstract

This thesis explores the embodiment of Chineseness in digital performance through the methodology of techno-choreography. In this practice-based research, I have created three full-length dance works: *X-Body* (2018), *Mourning for a dead moon* (2019) and *Unexpected Bodies* (2020). These three performances involve professionally trained dancing bodies in Chinese dance, cultural objects, scenography, software tools, real-time interactivity, virtual reality and immersion. The specific choreographing of cultural objects, including chopsticks, *gaoqiao*, handkerchiefs, fans and red silks, contributes to the research on dance and technology as well as current debates on cultural transexperience. The methodology of techno-choreography in this research draws on the theories of interactivity and immersion developed by Johannes Birringer, Steve Dixon, Scott deLahunta and David Rokeby. This methodology focuses on dancing bodies and objects as interfaces during the process of dance composition within computational system environments. The theories of Chineseness considered in this research are based on Xu Rui and Emily Wilcox's studies of Chinese dance. This thesis investigates the research questions of how Chineseness contributes to the process of techno-choreography, how technology affects the embodiment of Chineseness, and what Chineseness might be in the context of techno-choreography. The methodology of techno-choreography incorporates methods of improvisation, codified movements, motion tracking, programming, immersive design and scenography to explore and demonstrate Chineseness through interactions between dancing bodies and objects in the digital space. For instance, in *X-Body*, I create *sonic chopsticks*, a real-time interactive dance exploring chopsticks as interfaces performed by four dancers collaborating with live musician Dee Egan. In *Mourning for a dead moon*, I demonstrate body memories of Chinese classical dance working with CryptogamicLightCape designed by fashion designer Michèle Danjoux. In *Unexpected Bodies*, I experiment with red silks in virtual reality and develop writing Chinese characters through a dancing body, working with Oculus Quest 2. The outcome of the research is the generation of interactive performance frameworks which enable embodiments of Chineseness in digital performance. Dancing bodies trained in Chinese dance and cultural objects contribute to the methodology of techno-choreography, contesting to some extent an overly technological gadget driven discursive and performative practice encountered in the West. This thesis is the first to investigate the embodiment of Chineseness in digital performance through interfaces between dancing bodies and cultural objects in digital environments.

Contents

List of Figures

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Introduction

As a choreographer and a dancer who has professionally trained in Chinese dance (both Chinese classical dance and Chinese ethnic and folk dance) since I was 12 years old, dance is my way of thinking. Over the years of dance training, from a conservatoire onto higher education, my body language gradually became more sophisticated. This has enabled me to express what I am thinking in more complex ways and also to naturally propose questions through my dancing body. This study emerges from the experiences I have explored in the previous eight years as both a choreographer and dancer at Beijing Modern Dance Company and as an independent choreographer working with digital artists, musicians, installation and costume designers. Experiences of collaborating with interdisciplinary artists opened another door for me to explore the potential of dancing bodies. As an example I could mention an earlier production, *Attraction,* a very large-scale digital performance premiered at the Beijing National Stadium (also known as the Bird's Nest) in September 2012.[1] Observing the rehearsals for *Attraction*, I realised that methods of choreography for dancers with and without technology interventions were different, and they were also context specific. The presence of the dancing bodies under and in front of large installations, laser equipment, LED material and high-resolution projection screens could be easily minimised. I wondered about the potential meanings of professionally trained dancing bodies in multimediated, digital environments, and also in this particular case in a National Stadium in Beijing designed for the promotion of cultural excellence.[2]

After eight years of working experience in choreography, I brought this curiosity concerning dancing bodies in varied digital environments to my doctoral research. My Chinese dance training background allowed me to research interactive and immersive technologies while keeping questions of cultural identity at the centre. Conducting this interdisciplinary research in London, a megalopolis with diverse cultures, has helped me to investigate Chineseness in digital environments through the lens of interculturality, experiencing while also investigating my sense of growth as an intercultural movement practitioner whose work had been shaped by what Olu Taiwo, a Nigerian-British dance artist, has referred to as 'the cultural qualities of

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[1] *Attraction* was performed at the Beijing National Stadium from 2012 to 2014. I joined for two seasons as a choreographer and director.

[2] The stadium architecture was designed by Swiss architects Jacques Herzog and Pierre de Meuron, with artist consultant Ai Weiwei, and built for the 2008 Olympic Games in Beijing. Its circular shape is believed to symbolically represent heaven, but has been nick-named Bird's Nest, with its pattern inspired by Chinese-style crazed pottery.

inner dynamics' (Taiwo 2021: 4).[3] I have brought specific cultural qualities, energies and organic feelings with me, as they reside in my dancing body, but when I speak of digital environments I am of course acknowledging the widening spectrum of a trans-cultural, globalised world of information and the impact of interactive operational technologies on such performer bodies.

This practice-based research explores technology-driven choreography from the perspectives of cultural identity and cultural objects (chopsticks, *gaoqiao*, handkerchiefs, fans and red silks), investigating the embodiment of Chineseness in multimediated, digital environments. I investigate three research questions: 1. How does Chineseness contribute to the process of techno-choreography? 2. How does technology affect the embodiment of Chineseness? 3. What is Chineseness in the context of techno-choreography?

Chineseness in dance has been studied from the perspectives of history, anthropology, transcultural theory and philosophy. In this project, I build on existent research through foregrounding how Chineseness can be theorised through dance technology; in doing so I build on research on Chineseness carried out by Emily Wilcox, Fangfei Miao and SanSan Kwan. I question why Chineseness exists as an individual style in intercultural dancing bodies, and what Chineseness means in techno-choreography. In one of Wilcox's earlier publications concerned with Chineseness in dance, she summarises Chineseness as national character and points out:

> Rather, the problem of Chineseness is the self-conscious preoccupation of Chinese dancers with creating dance that is distinctively Chinese. The problem of Chineseness developed out of a particular history of cultural reflexivity and nationalistic concerns during the early twentieth century in which Chinese dancers, like artists in other fields, felt it was important to develop a uniquely Chinese "national dance form" (民族舞蹈形式). It resulted in a situation in which much of twentieth- and twenty-first-century Chinese dance, Sun's work included, is explicitly aimed at embodying and promoting a quality know as *minzuxing* (民族性), or "national character." Achievement in the world of Chinese dance is to

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[3] Taiwo's writing in *The Return Beat: Interfacing with our Interface* (based on his earlier PhD thesis at University of Winchester, 2006), is provocatively multidimensional, pressing towards a trans-cultural 'becoming' yet insisting on performative identities expressed through 'metabolic' (personal and ancestral embodied cultural memory and knowledge) and digital processes simultaneously. I was inspired by the intercultural studies from Melissa Chiu (2003), Royona Mitra (2015), Ben Spatz (2018), Cheryl Stock (2018), Ted Cantle (2020), and Olugbenga Taiwo (2021), and will return to the debate surrounding interculturalism further below.

embody and promote national character, or Chineseness, in dance form. (Wilcox 2012: 213)

Wilcox's extensive research has explored the development of Chineseness as a national character and how it has been expressed through Chinese dance. The aim is to embody and promote Chinese cultures. In Fangfei Miao's doctoral research on the cross-cultural misunderstandings of American modern dance and Chinese dance, or Chinese traditional dance as Miao calls it in her thesis, she argues that

> Like American modern dance – that accentuates values of self-expression, abstraction, minimalism, and rebellion against the past – Chinese traditional dance is rooted in values of *yin and yang* (阴阳: complementary opposites), *qi* (气: intrinsic energy), and *shen* (神: spirit). Both American modern dance and Chinese traditional dance are embodiments of their cultural concepts, which manifest in their dance vocabulary, choreography, education, and reception by their audiences. (2019: 7-8)

In *Kinesthetic City: Dance & Movement in Chinese Urban Spaces*, SanSan Kwan studies Chineseness from the idea of dancing body awareness in cities.

> I attempt to contribute to the conversation about Chineseness by understanding how this fraught yet abiding concept is negotiated through moving bodies in global cities. As the idea of habitus suggests, people both share common ways of inhabiting the body within specific communities and carry their own idiosyncratic ways of moving. In Chinese urban spaces, the various claims and disavowals of Chineseness as a community identification are made through corporeal motion. Through a feeling-each-other methodology, I aim to study this negotiation as a way both to understand how contended notions of Chineseness are bodily and, more largely, to make a claim for kinesthetic research as a form of knowledge production. (2013: 14)

I agree with Wilcox's argument of Chineseness as a national character in Chinese dance, Miao's findings of Chineseness as values embodied in Chinese dance and Kwan's claim for Chineseness as knowledge production in kinaesthetic cities. My own research takes these views forward and asks how Chineseness is embodied and translated into in digital environments and what Chineseness is becoming in intercultural dancing bodies. In probing this question, I seek to contribute to the notion of Chineseness based on intercultural dancing bodies, through my individual quest in techno-choreography. Based on studies of Shen Wei

and Wen Wei Wang who have professionally trained in Chinese dance, and reflections on my own dancing body, I explore Chineseness through the idea of interculturality in dance technology. I argue that Chineseness becomes an individual quest, exploring identity and the aesthetics of ancient Chinese cultures including poems, calligraphy, the paintings of *shan shui* (mountain-water) integrated with aesthetics, surrealism and abstract expressionism in the West. After years of personal exploration, Shen and Wang's choreographies form a 'hybridised aesthetic' (Mitra 2015: 16). Chineseness as an aesthetic still exists in their intercultural identities. New technologies, such as software tools, wearable technology, projection, virtual reality and immersion both enhance embodiments of Chineseness and expand the possibilities of Chineseness as an aesthetic.

In my research, I extend Johannes Birringer's more generalised theory of choreographic systems with a particularised cultural notion of Chineseness. In addition, a methodology of techno-choreography is developed which I base on theories of interactivity and immersion derived from Steve Dixon, Scott deLahunta, David Rokeby and Yacov Sharir. I will be adapting these theories to dancing bodies professionally trained in Chinese dance, and work with cultural objects to be inserted into digital performance including chopsticks, *gaoqiao*, handkerchiefs, fans and red silks.

> Digital performance is an extension of a continuing history of the adoption and adaptation of technologies to increase performance and visual art's aesthetic effect and sense of spectacle, its emotional and sensorial impact, its play of meanings and symbolic associations, and its intellectual power. Dance, ostensibly that most nakedly corporeal of all performance forms, has similarly been conceptualized as a continually evolving technological praxis… (Dixon 2007: 40)

Techno-choreography in this research presents dancing bodies contributing to the process of technological praxis. Cultural objects such as chopsticks, *gaoqiao* and fans function as interfaces triggering dancing bodies and computer-based technologies.

> Artistic practices that respond to technical interaction in our lives have absorbed technology as a creative tool, affording performers and designers the opportunity to explore distributed environments, virtual places, and hyper-conductivity. An entirely new poetics emerges when performers "navigate" interactive environments, dive into data-based information, play with digital cameras and wearable sensors; when the body becomes an instrument of a dynamic

environment in which realities are generated and processed. (Birringer 2008b: xxiii)

Building on theories from Dixon and Birringer, exploring dancing bodies with professional Chinese dance training backgrounds can provide insight into this field of enquiry. The research considers what kind of data-based information a cultural dancing body can generate and what kind of graphic effects are created based on the technique of motion tracking. In the monograph *Entangled*, Chris Salter claims that 'One of the overarching issues in the dance technology community was how such new technologies could or should enlarge dance as a historical and cultural practice' (2010: 263). As a choreographer, dancer and researcher, in this doctoral research I aim to provide approaches to techno-choreography through three dance works and contribute to this field of enquiry from the cultural perspective of Chineseness. The skilled dancing bodies examined in this research belong principally to dancers trained in China in such genres as Chinese classical dance, Chinese ethnic and folk dance, and modern dance techniques. I probe techno-choreography from the perspectives of both cultural dancing bodies and cultural objects as interfaces in digital performance. To date, there has been no previous research examining choreography and technology from the perspectives of Chineseness and cultural objects. This practice-based research aims to fill this research gap.

This research applies the methodology of techno-choreography to explore the embodiment of Chineseness in digital performance through three dance works: *X-Body* (2018), *Mourning for a dead moon* (2019) (in collaboration with DAP-Lab) and *Unexpected Bodies* (2020). Drawing on Birringer and Dixon's insights on dance technology, the methodology of techno-choreography includes dance composition, improvisation, motion tracking, mapping, programming, immersive design, scenography, cultural objects as interfaces, live composition, intensive participant observation and the concept of body mind. In addition, I primarily use Xu Rui and Wilcox's study on Chinese dance to support this research. I focus on Chineseness as an aesthetic in Chinese dance, which provides a comprehensive training for dance students. The methods of film footage study, case study, interviews and choreographic analysis are also applied in this research.

This research has involved the creation of three new contributions to dance studies and digital performances. First, unlike dance scholars and practitioners who study Chineseness from the

perspectives of Chinese dance history, dance politics, or dance anthropology, this practice-based research contributes to the study of the embodiment of Chineseness based on the methodology of techno-choreography. Techno-choreography is inspired by the theories of choreographic systems, interactivity and immersion in the work of Birringer, Dixon, deLahunta and Rokeby. Three full-length dance works involving different forms of experimentation such as solos, duets and group works were completed during this research and premiered with public audiences in London, United Kingdom.[4] Each of the dance works centres on one major research question relating to the themes of interactivity, wearable technology and immersion. My own body, trained according to the tenets of Chinese dance, was the subject of experiment and analysis during this research. My training background and working experiences offer a meaningful contribution to techno-choreography and cultural studies of the body by utilising artistic practices as test beds, means of experimentation and speculative ground for theories and praxis. This study can, thus, serve as a benchmark for future research on the relationship between dance, digital media, cultural identity and immersion in performance.

Second, this research contributes to the field of dance technology from the perspectives of cultural identity and cultural symbols. To date, digital artists, choreographers and scholars have explored software tools, sensors, computer-based technology, human-computer interaction, VR, AR, XR, immersion and installation with dance compositions. Most of these explorations analyse and theorize the technical-artistic side, whereas I propose to provide insights and choreographic approaches based on Chineseness, and a culturally-infused approach to performing with technological interfaces. Professional dance training forms body memories and skills, which are significant when dancing bodies entangle with new technologies. In addition, Chinese cultural objects enhance the design of interactive systems and immersive environments. The experimentation from this research provides references and ideas utilising chopsticks, *gaoqiao*, handkerchiefs, fans and red silks in relation to interactivity and immersion.

Third, I examine the embodiment of Chineseness through interculturality based on the study of Shen Wei, Wen Wei Wang, and reflections on my own dancing body. Living abroad, the

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[4] The filmed/captured live performance premiere for *Unexpected Bodies* took place on 9 December 2020, without audiences allowed due to the Covid-19 policies at Artaud Performance Centre, Brunel University London.

intercultural dancing bodies of these two artists present hybridised aesthetics. They have created dance works that also involve digital media, interactive design, installation and technologies, thus demonstrating to me new knowledge they acquired, providing parallel or comparative scenarios for my reflection. I see such scenarios as a pathway, in the modest sense in which Ben Spatz, who considers himself a diasporic Jewish artist currently based in the north of England, describes 'choreography as research' travelling on pathways to new knowledge, pathways already always travelled by others. Such travelling is like a 'searching movement' involving techniques that can bring one to a 'particular epistemic location' (Spatz 2018: 69). When thinking of choreographic research, I am aware of the cultural heritage infused into my bodily knowledge and technique. I feel responsibility for this heritage.

Entering into a detailed confrontation with theories of interculturalism or with the Western/Euro-American history of theatre anthropology and interculturalism of the 1970s and 1980s would exceed the scope of this thesis. But it needs to be mentioned that postcolonial scholars such as Royona Mitra (2015), along with Rustom Bharucha (1993; 2000), Una Chauduri (2002) and others, have developed a significant critique of a Eurocentric model of intercultural theatre perceived to have dominated the discussion of 'knowledge exchanges' exemplified by Jerzy Grotowski or Eugenio Barba's theatre anthropology or Peter Brook's 1985 production of the *Mahabharata.* In my dialogues with Birringer, who knew the practices of Grotowski, Barba and Brook more closely (whereas I had no contact with them), it became apparent that the intercultural research of that time—for example the paratheatrical experiments of Grotowski's Theatre of Sources or Barba's creation of the ISTA (International School of Theatre Anthropology) along with his Odin Teatret's work on exilic communities or floating islands—tended to be, in Bharucha's assessment, overshadowed by 'apolitical/asocial and subtly orientalist premises' which deny 'their own national identities and affiliations' (Bharucha 2000: 27). Brook's production is also taken to task for hiding what Cheryl Stock, offering a fresh perspective in her chapter for the second edition of *Contemporary Choreography,* remembers as contested ideas of 'self and other', 'about "the dominant" in intercultural exchange, guilt about the dangers of appropriation and "orientalism"' (Stock 2018: 343). She uses the term interculturality to refer to that which 'resides within the artists' own body and practice, played out in a multiplicity of ways through their choreography and performance' (347).

Mitra's 'new interculturalism', proposed in her recent book on British-Bangladeshi choreographer Akram Khan (whose work I have seen in London at several occasions), pushes beyond the older approaches and prefers to situate itself in a hybrid or diasporic cultural context allowing her to emphasise a politically 'strategic interculturalism' in Akram Khan's practice – in the UK and with the institutional support now underwriting Khan's own articulation of his 'otherness' (Mitra 2015). A practice, Mitra argues, that evolves 'through an open-ended corporeal aesthetic that is ambivalent and ephemeral and therefore impossible to fix in its significations' (2015: 23).

My own thinking at this point is more pragmatic: I cannot follow the Southeast-Asian postcolonial critique of Western and contemporary theorisations of particular epistemological locations or 'epistemological moments of race' (Spatz 2018: 79), as I have not experienced choreographic collaborations or contexts where I suffered discrimination, or expropriation of cultural objects and techniques. I feel that my work with choreographic objects is not overshadowed and circumscribed by binary (East-West) constellations. Rather, as I argue in my historical chapters on Chinese dance, the larger historical framework of techniques, in my affiliations, reflects a complex intercultural accumulation from the very beginning of the evolution of modern Chinese dance. My Chinese dance training is in itself not possible to pin down in a nationalist, racially and culturally marked, context.

Therefore, I am ready to align my thinking more discreetly with Chen Zhen's concept of 'transexperience', which I discovered in Melissa Chiu's study on Chinese experimental art of recent years (Chiu 2003: 3).[5] Chiu derives this notion of transexperience from investigations into the work of the late Chinese-French artist Chen, but proposes that it can be applied to the artistic expression of all of the overseas artists she examines in her writing (Chinese overseas artists working in Australia, the United States, and France). [6] Chen's own idea of

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[5] In her opening chapter, Chiu examines recent exhibitions and exhibition catalogues published in China and abroad, and comes to the conclusion that there is a relative exclusion of overseas Chinese artists from the discussions of Chinese art, which 'has the effect of marginalising the specificity of the diasporic experience, seen most notably in an expression of Chineseness. The lack of specificity found in many accounts of Chinese contemporary art between Chinese artists residing in mainland China and those in the West is the subject of this dissertation' (Chiu 2003: 11).

[6] Chiu proposes to investigate the migration of leading Chinese cultural figures to Australia, the United States, and France in the late eighties and early nineties, since it occurred in substantially greater numbers than in previous decades. She focuses on artists who migrated to the West, tracing their engagement with different Western cultures in the first decade of their residence outside China, and argues that this Chinese diaspora engages in various ways with different cultures to reconfigure a notion of Chineseness (Chiu 2003: 24-25). The artists examined include Chen Zhen, Dong Wang Fan, Guan Wei, Shen Yuan, Cai Guo Qiang, Guo Jian, Zhang

'transexperience "summarizes vividly and profoundly the complex life experiences of leaving one's native place and going from one place to another in one's life"' (cited in Chiu 2003: 25). Apart from the physical dimension of migration, the experience of transexperience is transported into Chen's art practice, Chiu argues (2003). For Chen, transexperience is:

> a mode of thinking and method of artistic creation that is capable of connecting the preceding with the following, adapting itself to changing circumstances, accumulating year–in–year–out experiences, and being triggered at any instant. Furthermore, this type of experiential concept relates to an extremely important matter, that is, to immerse oneself in life, to blend and identify oneself with others. (cited in Chiu 2003: 25)

Following my path, I argue that Chineseness is the catalyst of creations for performers and choreographers abroad with professional Chinese dance training backgrounds. The Chineseness in the work of such artists and choreographers has been expanded in their dance compositions in various ways. In the three collaborative dance works created in this research, I reflect on the Chineseness of my dancing body during intercultural creative experiences with artists with different cultural backgrounds, most of whom now live abroad or have absorbed new experiences and techniques.

This practice-based research also provides locations – a set of interactive systems (constructed by patches based in the Isadora software). Dance and theatre practitioners can explore daily objects using this set in addition to learning about movement generation in immersive environments. In the experimentation, I found that professional dancers are easily focused on their skilled dancing bodies and lack awareness of the possibilities provided by computer-based technologies, in a new setting which needs time to generate such awareness. The same issue occurs for choreographers who have just started working with digital technologies. In the dance films created as part this research and in Chapters 3, 4 and 5 of this thesis, there are visible changes in how my own awareness of digital dance potential improved while working with software tools and technological equipment.

Hongtu, Huang Yong Ping, Ah Xian, Xu Bing, and Wenda Gu. Chiu also acknowledges the notion of diaspora, as 'one of the most commonly applied theoretical models to overseas Chinese artists…This is because it is one of the most widely used terms to describe the experience of dislocation from one's homeland' (Chiu 2003: 34).

This thesis comprises six chapters. In Chapter 1, I examine Chineseness from two main perspectives on Chinese dance and interculturality. Theories of Chinese dance derived from Jiang Dong, Xu Rui, Wilcox, Yuan He and Zheng Huihui are considered. I demonstrate that Chinese dance, consisting of Chinese classical dance and Chinese ethnic and folk dance, embodies Chineseness. The pioneers of Chinese dance, Wu Xiaobang, Dai Ailian, Choe Seung-hui and Qemberxanim, spent many years exploring dance forms that can encapsulate Chinese culture. To date, Chinese classical dance has developed three major styles, which include *shenyun* by Li Zhengyi and Tang Mancheng, *Han-Tang* by Sun Ying and *Dunhuang* by Gao Jinrong. Inspired by idea of transexperience and interculturality, I reflect on my own training experiences with contemporary dance and Chinese dance. Based on the studies of Shen Wei, and Wen Wei Wang and my own dancing body, I found that Chineseness exists as core aesthetics of these intercultural dancing bodies.

In Chapter 2, I review the development of dance and technology since the 1960s. Artist-scholars discussed include Birringer (2003, 2008a, 2008b, 2019), Dixon (2007), deLahunta (2002a, 2017), Sharir (2012), Susan Kozel (2007; 2010), Susan Broadhurst (2007; 2017) and Chris Salter (2010). These practitioners and theorists have advanced performance and dance technology theory from the perspectives of interactivity, mixed reality, virtual reality, digital bodies and immersion. In addition, works created by Merce Cunningham, Bill T. Jones, William Forsythe, Sharir, Ellen Bromberg, Kozel, Igloo, DAP-Lab, Robert Wechsler, Wayne McGregor, Alexander Whitley and Lisa Naugle significantly contributed to this research on dance technology. I then turn my attention to the development of dance and technology in China. Liu Chun, Xiao Xiangrong, Li Qing and Tian Tian have created works involving real-time interaction, digital media and installation. This segment of the research provides useful insights into the development of dance technology in China. I study theories of choreographic systems and immersion. Three works are examined: *kimosphere no. 5* by DAP-Lab, *Whist* by AΦE and *+/- Human* by Studio Wayne McGregor. Finally, I explain the methodology of techno-choreography, which is developed based on theories of choreographic systems and immersion.

Chapter 3 presents an analysis of my first creation, *X-Body* (2018). As the director, choreographer and one of the dancers for this work, along with Miziying Wang, Jiajie Zhou, Rumeng Li and Limeihui Zhu, I discuss the interactive designs of dancing bodies and live compositions by sound artist Dee Egan. *X-Body* utilises codified movements, improvisation,

sonic art, props, projection and cameras to investigate how interactivity could change the manner of dance making and what I experience in the process of dance composition. Based on the idea of kimosphere, I create an interactive dance exploring the concept of sonic chopsticks. Using chopsticks as an instrument, I demonstrate how chopsticks can contribute to interactive performance and generate new knowledge of Chinese cultural objects. I generate the embodiment of Chineseness in a digital environment drawing on an analysis of the choreographic process, the kimosphere utilised in dance studios and shared spaces constructed by dancers and Egan.

My digital performance collaboration with DAP-Lab in *Mourning for a dead moon* (2019) is scrutinised in Chapter 4. I work with Michèle Danjoux, a fashion designer and scholar. I argue that body memories can be triggered automatically when a dancing body is entangled with wearable technology. The techniques of Chinese classical dance help me deal with CryptogamicLightCape, a black velvet and LED light cape designed by Danjoux. Collaborating with artists from different countries in this work provides an opportunity for me to reflect on Chineseness in a transcultural environment. *Gaoqiao* as prosthetics is also examined in this chapter. The traditional props of *yangge* are considered in relation to their potential in an immersive atmosphere.

Chapter 5 is a study of my final creation, *Unexpected Bodies* (2020), a solo dance work based on my more advanced methodology of techno-choreography. New techniques are explored through choreography. These techniques include live drawing, motion tracing, mapping, web-camera and the VR headset Oculus working with cultural objects such as chopsticks, *gaoqiao*, handkerchiefs, fans and red silks. The intention is to examine the possibilities of cultural objects in digital environments and to consider how these objects, working with a dancing body, contribute to the process of techno-choreography. In this creation, I find that the cultural instruments (the objects my dancing body deploys and wears in this work) are the most important elements. Digital and computer-based technologies improve visual effects, but the choreographer's intrinsic perceptions (generated through the live dancing body interacting with cultural objects) under technology are vital, primarily.

In the final chapter, Chapter 6, I argue that dancing bodies professionally trained in Chinese dance and using cultural objects contribute significantly to the process of techno-choreography, in fact alter the assumptions about such techno-choreographies. Technology-

driven choreography, however, also affects the embodiment of Chineseness. The outcomes of this practice-based research include three dance works, three dance films, a set of interactive systems and the thesis, providing approaches for dance practitioners to enter the field of dance technology and become aware of the importance of cultural affect transposed into the experience of interface performance.

Chapter 1. Chineseness

In this chapter I will explore the concept of Chineseness by examining the intersections between aesthetic forms embodied by dancing bodies professionally trained in Chinese dance, and through cultural objects applied in Chinese dance. Dance practitioners constantly explore the embodiment of Chineseness in their creations. Chinese dance as an artistic genre and a comprehensive training system began in the middle of the twentieth century and developed rapidly after the 1950s. Chinese dance falls into two categories: Chinese classical dance and Chinese ethnic and folk dance.

1.1 Founding Figures of Chinese Dance

The daughter of the Qing ambassador to France, Yu Rongling (1888-1973) studied modern dance with Isadora Duncan (Zheng 2019c: 359). She loved Western cultures, an observation which could be determined from her creations. 'In 1904 Yu created three "Chinese dances" and performed at least one of them, *Ruyi Dance*, along with "Spanish" and "Greek" style dances, for the Qing empress dowager Cixi at the imperial Summer Palace in Beijing' (Wilcox 2018: 7). As Chinese dance developed, Wu Xiaobang (1906–1995), Dai Ailian (1916–2006), Choe Seung-hui (1911–1969), and Qemberxanim[7] (1914–1994) went on to become recognised as the founding figures of Chinese dance (Jiang 2008; Wilcox 2018; Yuan 2019).

According to Zheng Huihui, a professor of dance at Shanghai Normal University, Wu Xiaobang is 'the father of Chinese modern dance' and 'New Dance', which changed the direction and the development of Chinese dance (2019a: 257). 'Wu Xiaobang studied dance in Japan with Takaya Eguchi, who was in turn influenced by German modern dance, having worked with Mary Wigman in the early 1930s (Nikaido, cited in Kolb 2017: 352). Wu Xiaobang's original name was Wu Zupei, but due to his adoration of Polish composer Frédéric François Chopin, he changed his name to Wu Xiaobang (Zheng 2019a: 258). In Chinese, the first name *Xiaobang* has very similar pronunciation as *Chopin*. Wu cultivated numerous generations of Chinese dance artists. When he was nearly seventy years old, Wu was still travelling across China to lead workshops and rehearsals and to teach classes.

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[7] In Chinese documents, Qemberxanim's birth year is 1922, but in Wilcox's (2018) research, talking with dance historians in Xinjiang, she states that she believes Qemberxanim was born in 1914.

Dai Ailian is one of the Chinese dance founders who was born on 10th May 1916 in Couva, Trinidad (Jiang 2008; Wilcox 2018; Zheng 2019). 'Because Trinidad was at the time a British colony, Dai's citizenship would have been British. Dai attended British-style schooling in Trinidad through to the age of fourteen, after which she moved to London with her mother and two sisters. The language Dai spoke growing up was English (she also studied French and Latin in school), and although she learned to speak Mandarin after she moved to China, she never learned Cantonese, her paternal grandparents' native tongue' (Wilcox 2018: 16-17). 'She studied ballet with Anton Dolin, Margaret Craske, and Marie Rambert in 1930s London and modern dance with Kurt Jooss and Sigurd Leeder in Dartington Hall' (Kolb 2017: 352). In the 1940s, Dai emigrated to China. She brought back ballet techniques and the concept of modern dance; she spent her entire life excavating, organising and developing Chinese ethnic and folk dance (Zheng 2019a).

Choe Seung-hui was a Korean dancer who went to China twice to help Chinese dance artists construct Chinese dance, working with Chinese *xiqu* master Mei Lanfang.

> Choe Seung-hui was born in 1911 into a declining *yangban* family in Seoul during the Japanese colonial rule of Chosen (Korea), which lasted from 1910 to 1945. In 1926 Choe moved to Tokyo to study with Japanese dancer Ishii Baku (1886–1962) … In 1943 Choe sought training from Mei Lanfang in Shanghai and proposed the idea of creating a new dance style by studying and adapting elements of xiqu performance, specifically Peking opera and Kunqu. In 1944, Choe moved to Beiping and set up the Oriental Dance Research Institute (Dongfang wudao yanjiusuo), with support from Mei and other renowned xiqu actors. (Wilcox 2018: 67-68)

This was the first time she went to China, and the cooperation with Chinese *xiqu* master Mei Lanfang during this time contributed to her second residence in China in 1949. After two years, she hosted the Choe Seung-hui Dance Research Course, where the ballet and dance methods she learned helped numerous dance students.

> Students in the 1951-52 Choe Seung-hui Dance Research Course received studio training in all of Choe's major areas of expertise, including Korean classical and folk dance, Southern dance (*nanfang wu*), Soviet ballet and folk dance, New Dance, improvisation, and rhythm, as well as theoretical courses in dance history, political thought, literature, and music. The focus of the course, however, was on

> studying and organizing basic movements for Chinese dance derived from xiqu….
> By training in these movements, she believed, students would gain a physical
> fluency in xiqu movement vocabulary, which they could then use to create their
> own new Chinese dance choreography. (Wilcox 2018: 71-72)

Qemberxanim, a Uyghur dancer, was born in Kashgar and grew up in a traditional folk music family. In 1927, she went to the Soviet Union with her parents and trained in classical ballet and Soviet folk dance from the age of thirteen (Zheng 2019b: 288).

> In 1951 Qemberxanim was appointed founding chair of the academy's Department
> of Minority Nationality Arts (Shaoshu minzu yishu xi), which became the PRC's
> first state-sponsored professional program dedicated to training performing artists
> from minority ethnic backgrounds. Under Qemberxanim's leadership, the program
> recruited 150 students from eleven different nationalities during its first year,
> including folk artists, elementary school teachers, students, and government
> functionaries. (Wilcox 2018: 64)

Through Wu, Dai, Choe and Qemberxanim's initial explorations of Chinese dance, and the efforts of generations of dance workers in China, Chinese dance has developed into a systematic teaching system and a public performance genre. In 2019, Jiang Dong, a leading Chinese dance scholar from the Chinese National Academy of Arts, hosted a series of conferences, *70 Years of China's Dance Art: Talk on Five Masters,* the proceedings of which were published by the *Journal of Beijing Dance Academy.* The conferences invited five dance experts each time to discuss their experiences in the establishment of dance in China. These conferences used oral histories to help dance workers see the vivid images of Chinese dance history. Yuan He, the first doctoral graduate of dance studies in China and a professor at Beijing Dance Academy, edited the book *Chinese Dance History* (2019), which examines dance in China from the ritual dance of the Shang Dynasty to contemporary China. Emily Wilcox, an Associate Professor of Chinese Studies at the College of William & Mary, spent ten years across China conducting research and then published the monograph *Revolutionary Bodies: Chinese Dance and the Socialist Legacy* in 2018. In this significant book, and as a scholar with an outside perspective yet intimate knowledge of Chinese dance history, Wilcox defines three commitments of Chinese dance as kinesthetic nationalism, ethnic and spatial inclusiveness, and dynamic inheritance.

Kinesthetic nationalism is the idea that what distinguishes Chinese dance as a genre is its aesthetic form, not its thematic content or where or by whom it is performed. According to kinesthetic nationalism, what makes Chinese dance "Chinese" is that its movement forms—its movement vocabularies, techniques, and rhythms, for example—are developed through ongoing research and adaptation of performance practices of Chinese cultural communities, broadly defined. In Chinese dance discourse, this idea is most often expressed through the concept of "national form" (*minzu xingshi*), a term promoted by Chinese Communist Party leader Mao Zedong beginning in the late 1930s that continues to inform the theory and practice of Chinese dance today. When the idea was introduced, "national form" referred to new or yet to be created literary and artistic forms that would express contemporary life and bring about positive social change by being both resolutely modern and rooted in local culture. Thus, kinesthetic nationalism is focused on issues of artistic form and is premised on the idea that the local and the contemporary are mutually reinforcing.

Ethnic and spatial inclusiveness is the idea that Chinese dance should include styles and artists from all ethnic communities and geographic regions across China. As in many places, differences of ethnicity and geography in China often map onto disparities in historical privilege and power. Ethnic and spatial inclusivity, considered radical when it was introduced, proposes that China's national dance forms should not be an expression only of dominant cultural groups—such as the Han ethnicity or the affluent coastal cities—but instead should incorporate the cultures of ethnically and geographically marginalized communities, such as non-Han groups, rural places, and inland regions. While there is no single term like "national form" that expresses this idea in Chinese dance discourse, ethnic and spatial inclusiveness builds on the concepts of the "Chinese nation" (*Zhonghua minzu*) and "remolding" (*gaizao*), both of which were important in Chinese socialist culture from the 1940s onward. The concept of the "Chinese nation" theorizes Chinese identity as a historical accumulation of diverse cultures and groups. "Remolding" describes the retuning of artists' sensibilities to shed prejudices, especially those against poor and rural communities.

Dynamic inheritance is a theory of cultural transformation that compels Chinese dance artists to research existing performance forms while also generating original interpretations of these forms. It is guided by the premise that cultural traditions inherently change and that they thus require continual innovation to maintain relevance to the contemporary world. In a basic sense, dynamic inheritance refers to the idea that cultural inheritance and individual innovation are mutually reinforcing processes. In Chinese dance discourse, a common phrase used to describe dynamic inheritance is "inherit and develop" (*jicheng yu fazhan*). Apart from being an abstract way of defining the artist's goal in a theoretical sense, it

also implies a specific set of creative methods. Thus, in both theory and practice, dynamic inheritance is what allows Chinese dance practitioners to take cultural continuity in new directions. (2018: 6-7)

I propose that the aesthetic forms are the embodiment of Chineseness so that the innovation and development of Chinese dance, including Chinese classical dance and Chinese ethnic and folk dance, are explorations of Chineseness.

1.2 Chinese Classical Dance

Chinese classical dance mainly includes three styles, *shenyun*, *Han-Tang* and *Dunhuang*.[8] All three styles have the same goal – embodying Chineseness. The difference between the generations of these styles is their exploring aesthetics based on artistic resources from different periods of China, the Former Qin (351–394) to Qing dynasty (1636–1912). Chinese classical dance was extracted from traditional *xiqu*. '*Xiqu*, China's pre-eminent indigenous performance structure, is a highly stylized synthesis of music, speech, dance-acting and acrobatics. *Xiqu* is an umbrella term that encompasses several hundred local regional forms as well as *kunqu* and *jingju*, forms that achieved national prominence in the Ming and Qing dynasties respectively' (Evans 2009: 21). Zheng demonstrates three aspects of the initial development of Chinese classical dance.

> The first was to proceed from the actual needs of creation. For the creation of classical style dance drama, People's Cultural Work Troup, working with more than twenty *Beikun*[9] artists, constructed a Dance Drama Troup. Then, combined with the dance ensemble of the Central Academy of Drama, Wang Ping, Sun Tianlu and Fu Zhaoxian assembled a Dance Drama Research Group that conducted research and practice of Chinese classical dance. Second, Chinese classical dance has been taught since the beginning of dance exploration, which includes *Wuyun Ban* in 1951 and the dance ensemble of Central Academy of Drama in 1952. Both training courses invited *xiqu* teachers to deliver *xiqu* techniques of *qiba*, *zoubian*, *qiwu* (flag dance) and *chouwu* (silk dance). Third, the Choe Seung-hui Dance Research Course, hosted by Choe in 1951, helped the establishment of Chinese classical dance. Choe was a Korean dance artist and had experience in how to sort out and develop folk dance. Choe, working together with Chinese *xiqu* artists, organised three categories of movements, and then developed

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[8] In addition to these three major styles, there are other explorations of Chinese classical dance including Neo-Classic Dance Company by Taiwanese scholar Liu Fengxue, and *Kun Wu* by Ma Jiaqin.
[9] *Beikun* is a genre of *xiqu* based in northern of China, Beijing and Hebei providence.

dance pedagogies which combined dance movements and folk music together. (2019b: 304-305)

From Zheng's research, it is clear how *xiqu* has contributed to the establishment of Chinese classical dance. Creating a dance genre was challenging under limited social and economic conditions in the 1940s. During this time, Korean dance artist Choe had a clear direction of how to help China construct the genre. 'Choe explained, creating new dance art would not mean simply transferring these existing movements onto the stage. Rather, as she had learned from her past experience, it would require significant reworking—documenting, analyzing, synthesizing, organizing, systematizing, and creating—to make the movements expressive enough to stand on their own as dance, without the support of lyrics' (Wilcox 2018: 69-70).

After one year, the first group of Chinese classical dance students graduated from the Choe Seung-hui Dance Research Course (in 1952), and they went on to become the first generation of dance teachers at the Beijing Dance School, which was established in 1954. With Choe's help, dance students had the opportunity to learn difference genres of dance and the basic sets of *xiqu* movements. 'By training in these movements, she believed, students would gain a physical fluency in xiqu movement vocabulary, which they could then use to create their own new Chinese dance choreography' (Wilcox 2018: 71-72). The significance of Choe's contribution to the construction of Chinese classical dance is the methods, so I argue that the Choe Seung-hui Dance Research Course has impacted the development of Chinese classical dance for decades.

Along with Choe, there are two other key figures who contributed to the development of Chinese classical dance. One is Ouyang Yuqian (1889–1961), the Dean of the Central Academy of Drama. Ouyang organised the most important courses, the *Wuyun Ban* and the Choe Seung-hui Dance Research Course in 1951, and he made the decision to learn from *xiqu* and martial arts in the establishment of Chinese classical dance. Ouyang was the first person proposing the concept of Chinese classical dance (Jiang 2008).

Ye Ning (1919–2017) contributed to Chinese classical dance both in practice and theory from the 1950s. Her idea of learning from *xiqu* was the same as Ouyang and Choe. She argued further that learning deeply from *xiqu* was necessary, but one needed to spend time exploring the rules and disciplines of dance. Improving creativity and learning the four main elements of

xiqu—*chang* (singing), *nian* (speaking), *zuo* (moving), *da* (fighting)—were significant, so that teachers could create a new form of dance and a training system (Jiang 2008).

Chinese classical dance has been widely debated over the past seven decades. The main dispute was concerned with which style of *shenyun* by Li Zhengyi and Tang Mancheng, *Han-Tang* by Sun Ying and *Dunhuang* dance by Gao Jinrong, was best equipped to embody Chineseness. 'The inheritance of ancient court dance was "broken", and no independent dance form existed in the twentieth century from which dancers could develop a national form. Dance practitioners seeking to create a Chinese national dance form in the twentieth century felt they had to choose between two potential sources of indigenous tradition: "living traditions" such as *xiqu*, martial arts, and folk dance, or "non-living traditions" such as ancient funerary statues, literary references, and paintings' (Wilcox 2012: 222). Professor Tang Mancheng, one of the creators of *shenyun*, argued that *xiqu*—which appeared in the Ming dynasty and became popular in the Qing dynasty—is a visible and tangible resource. It absorbed cultural ideas and abandoned meaningless art factors to enable specific significance in its inheritance of the cultural (cited in Zheng 2019c: 365).

Shenyun, or body rhyme in English, is one style of Chinese classical dance embodying Chineseness through dancing bodies' *yunlü* (韵律) which involves Chinese philosophy and aesthetics.[10] The training system is created based on *xiqu* and ballet in the 1950s. The creators of *shenyun* scrutinised the pedagogy from motifs to analyse the law of action: a training method that 'initially formed a set of training systems using waist as the axis, including twisting, tilting, round, curved, internal and external combination, also the genre is unique to other dance forms' (Gao 1986, cited in Zheng 2019c: 355). 'The goal in creating *shenyun* is, "through the content of *shenyun* classes, to grasp the unique aesthetic characteristic of our national tradition (*minzu chuantong)* to make it manifest concretely in the movement patterns and principles of the human physique, and to make students, through study, master these quintessences within national traditional dance"' (Li 2004, cited in Wilcox 2012: 218). Li Zhengyi explains that *shenyun*, created from 1954 to 1959, occupies a crucial position in Chinese classical dance. The first edition of *Teaching Method for Chinese Classical Dance*

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[10] Detailed arguments about *Shenyun* could be found in Jiang, Dong (2008) *A Research on the Development of the Chinese Classical Dance*, PhD Thesis, Chinese National Academy of Arts; and Wilcox, Emily (2011) *The Dialectics of Virtuosity: Dance in the People's Republic of China, 1949-2009*, PhD Thesis, University of California, Berkeley.

was published in 1960. Since then, the pedagogy has spread across dance schools and universities in China (Li 2007).

Sun Ying, the creator of *Han-Tang* classical dance, has a different opinion regarding *shenyun*'s embodiment of Chineseness. Sun argues that 'the established program [*shenyun*] is flawed because it teaches ballet methods such as pointed feet, barre exercises, and so on, whereas his does not. "Ballet is Western, not Chinese!"' (Wilcox 2012: 219).

> Even beyond its problematic adoption of ballet (which Sun sees as fundamentally antithetical to the project of promoting Chineseness), the integration approach is still flawed because it chooses the wrong period of Chinese history on which to base its aesthetic of Chineseness. Rather than drawing aesthetic inspiration, as the integration approach does, from the Ming-Qing era (from the fourteenth to the twentieth century), Sun argues that aesthetic inspiration should be drawn instead from the earlier Han-Tang era, hence the name of his Han-Tang school. (Wilcox 2012: 220)

Sun claims that it is vital to grasp the styles and forms of classical dance before *xiqu*, understanding cultural connotations and analysing documentary records (2005). In his research, Sun has focused on creating dance works imitating postures and gestures based on literature, statues, images, paintings and poetry from the Han and Tang dynasties.

Dunhuang is another major school of Chinese classical dance, which was created by Gao Jinrong, who is a graduate of the Choe Seung-hui Dance Research course. In contrast with *shenyun*'s aesthetics from *xiqu*, an art genre from the Qing dynasty and *Han-Tang* aesthetics from the Han and Tang dynasties, *Dunhuang* is based on paintings in the Mogao Caves in Dunhuang city, Gansu province, China.

> When I arrived in Dunhuang in 1979, I started to try to bring Dunhuang murals into the dance classroom and tried to establish a teaching system for *Dunhuang* dance. During the process of establishing the teaching system of *Dunhuang* dance, the greatest challenge was the establishment of movements. After consulting and learning from scholars in Dunhuang study, I found the direction: capturing the three-in-one combination of *Xiliang Yue* (西凉乐) as the goal, creating a harmony of rhythm and postures. (Gao 2019: 2)

He Yanyun, an expert of *Dunhuang* dance, claims that *Dunhuang* dance is directly derived from the dancing posture images of the Dunhuang murals, which have existed for thousands of years. The Dunhuang murals provide rich content, vivid figures and a sense of beauty with a clear cultural background (2009). In contrast to *shenyun* and *Han-Tang*'s aesthetic excavations, the movement vocabularies of *Dunhuang* dance focus on the shapes of hands, arms, necks, waists, legs and feet. Curved arcs and twisting movements constitute the unique aesthetic values of *Dunhuang* dance.

In general, Chinese classical dance as a national dance form continues to explore the embodiment of Chineseness. *Shenyun*, *Han-Tang* and *Dunhuang* dance constructed comprehensive training systems for dance students in China, and it provides intensive guidance on techniques, physical coordination, movement aesthetics, and methods of moving. The notion of *gudian* (classical) in '*Zhongguo gudianwu* refers to a quality of shared cultural inheritance that in theory unites all Chinese people through time and space' (Wilcox 2012: 215).

1.3 Chinese Ethnic and Folk Dance

Chinese ethnic and folk dance embodies multi-ethnic integration and cultural inheritance across China's populations and regions. During the development of Chinese ethnic and folk dance, Qemberxanim (1914–1994), a Uyghur dancer, contributed significantly to this national dance.

> Qemberxanim developed her own teaching curricula that broke down movements according to seven categories: salutations, head movements, waist movements, steps, arm and hand movements, turns, and squats or pliés. These curricula later served as the foundation for similar courses in minority dance taught at the Beijing Dance school, whose instructors were personally trained by Qemberxanim. In addition to coursework, students in the department participated in frequent performances and also conducted organized field research trips. The graduates of this program went on to become prominent leaders in arts institutions specializing in minority nationality performance across the northwest region. (Wilcox 2018: 64-65)

Qemberxanim's training methods helped the development of Chinese ethnic and folk dance. Along with Qemberxanim, Sheng Jie, Peng Song, Luo Hongyan, Wang Liancheng, Xu

Shuying, and Zhu Ping, who were members of the first Chinese folk dance instructor training class, promoted the teaching curricula in the 1990s. They spent time living together with folk artists, not only learning the styles of minority dances but also feeling folk artists' everyday life so that they could imagine those scenes for folk dance performances. Xu states that Chinese folk dance is the 'living fossil' of traditional Chinese dance culture, and that it is a typical dance form in contemporary arts (2014: 2). Young generations have the opportunity to learn folk dance with folk artists and then can use what they learned to create training courses and dance works.

The first characteristic of Chinese ethnic and folk dance is that the cultural inheritance remains alive and ongoing even in the present day. Xu claims that the continuity of cultural inheritance has been well-protected because traditional Chinese farming was not fatally interrupted during the turbulent development of China. China is a typical multi-ethnic country. Many ethnic groups, diverse topographies, differences in production and ecological environments have left room for the development of various ethnic folk dances and rich cultural heritages (2014). Each ethnic group—Tibetan, Kam, Mongolian, Miao, Dai, Uyghur, Korean and Han—has its own dance form. Dance vocabulary and movement rhythm are very different between these various forms of folk dance. Chinese ethnic and folk dance 'contains a far broader range of modes and forms. Although, in terms of its folk characteristics, it possesses close cultural links to its ethnic roots; it displays a greater openness in terms of dance creation, allowing greater creativity and exhibiting a broader range of styles' (Xu 2016: 206).

Yangge is the ethnic dance of the Han people. In this practice-based research, I have explored the materials and props of *yangge* through technology-driven choreography to study the embodiment of Chineseness in Chapter 5. It is therefore important to examine *yangge* in this chapter.

There are two types of *yangge*: *gaoqiao yangge* (people are standing on stilts) and the performance without stilts called *di yangge* (ground *yangge*). The most famous *Fushun yangge*, *Haicheng gaoqiao* and *Liaoxi gaoqiao* were listed as China's intangible cultural heritage in 2006 by the State Council of the People's Republic of China. The oldest known origin of *yangge* can be traced back to the Song Dynasty (959-1278), which is closely related to agricultural harvest and folk festival activities (Graezer 1999, Gerdes 2008, Zheng 2019).

Gaoqiao yangge requires more skills to perform it. The legs of performers bond with the stilts, whilst wearing different character costumes and moving in lines or circles. The size of teams ranges from more than ten to dozens of performers. Most performers depict the narrative of an ancient myth or historical story. The costumes are mostly imitating those of opera. The common props are fans, handkerchiefs, wooden sticks, scarves and knifes. The *gaoqiao* varied in height, from 30cm to 300cm. *Gaoqiao* have quite technical requirements for the performer, not only in order to stand firm, but also to control the extended legs to do jumping, crossing and running movements.

Yangge experienced significant changes in wartime and became a political tool during a pivotal period in Chinese history, but now, it has turned back to its traditional aesthetics, cultural identity and stage performance practices. 'The people who practice *Yangge* in China today are not merely practicing a dance form that was manipulated and suppressed by the government of their country; they are practicing movements that are important to their memories, to their histories, and to their relationships with each other' (Gerdes 2008: 146). As pointed out in the Gerdes study, *yangge* is now completely different from its wartime counterpart. 'They have taken on a dance form entangled with politics to serve their own human purposes; they are dancing to find their identities within their country and community's culture' (Gerdes 2008: 146).

During wartime in the 1940s, *yangge* became a dance form of propaganda called *New Yangge*. In Luyi Arts Academy in 1942, Yan'an's[11] first *New Yangge* team was formed by several actors and some workers, after the *Yan'an Forum on Literature and Art*. On 9th February 1943, the Luyi *Yangge* team, consisting of 150 people, was further reformed (Zheng 2019a: 275). The *yangge* team was composed of workers, peasants, soldiers, scholars and businessmen from various circles, and they replaced the traditional *yangge* props and characters. This style and spirit, the power that the government and the Communist Party needed in the civil war, united the people together. '*New Yangge* symbolized the emerging Chinese socialist culture developed in Yan'an, a remote area located in northwest China that had become the base of the Chinese Communist Party (CCP) in 1935' (Wilcox 2018: 24). The CCP realised the power and positive effects of *yangge*, then went on to further develop it into two types during the 1940s.

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[11] Yan'an is the centre of the Chinese Communist revolution from late 1935 to early 1947, a city in Shanxi province, China.

The first type featured dramatic productions known as "*Yangge* theatre" (*Yangge Ju*), which adapted local musical tunes and performance conventions to perform revolutionary stories, usually centering on poor peasants and their desire for social change. The most well-known examples of this genre were *Brother and Sister Open the Wasteland* (*Xiongmei kaihuang*, 1943), *The White-Haired Girl* (*Baimao nü*, 1944), and *Liu Hulan* (1948). The second type featured participatory events such as parades and communal dances, in which *Yangge* groups entered public spaces performing collective dances accompanied by loud drumming, gongs, and colourful scarves, usually inviting bystanders to join in. Both forms of *New Yangge* used a specific type of bodily movement known as *niu Yangge* (literally, "twist Yangge"), referring to a distinctive hip-swiveling walk performed in *Yangge* dance. (Wilcox 2018: 26-27)

In the study of *yangge* in the middle of twentieth century, Wilcox refers to *yangge* during the 1950s to 1960s as 'Cold War *Yangge*' (2020: 33). She claims,

Cold War *yangge* was different from wartime *yangge* in that it drew upon a broader range of Han folk practices, including those from regions of southern China that had not been under CCP control before 1949. It also differs from wartime *yangge* in its greater emphasis on performance technique and professionalised stage aesthetics. Despite these differences, Cold War *yangge* maintains the basic formula of wartime *yangge* – it emerges from collaborations between Party intellectuals and folk artists and uses the aesthetics of rural performance modalities to promote the political agenda of the Chinese Communist Party. (2020: 34)

During the Cultural Revolution, Jiang Qing, Mao Zedong's wife, changed a large number of dramas and dance works, such as the Chinese classical ballet *The White Haired Girl*, modifying the movement style and the character. She also changed the paces of *yangge* in order to make it easy to learn. However, she went further and also removed the humour and exaggerated expressions of the characters in *yangge*, having 'heavily supervised the arts during the Cultural Revolution and made them support existing political ideology' (Gerdes 2008: 141).

Yangge has become the most popular entertainment and community dance in northern China nowadays. It is a leisure and fitness activity in the daily lives of some middle-aged and elderly people, and it has a rich cultural connotation. People can easily see crowds wearing colourful

costumes doing twisting *yangge* and also more and more young people join them. Wilcox describes the scenes of twisting *yangge* or *niu yangge*. 'A common action in *niu Yangge* involves the dancer performing a bouncing version of a jazz square (stepping across, back, side and forward), while the top of the head bobs from side to side, hips twist freely, and wrists spiral in opposite directions with the elbows tucked in and hands spinning, often holding a fan or handkerchief, at waist level' (2018: 27). In Jonathon Scott Noble's research, he points out that 'The performance of a revolutionary form of *Yangge* today in China does not necessarily carry with it the ideology that had been associated with it during the Maoist era' (2003: 113).

Dongbei yangge is one category of *yangge* and a popular entertainment for ordinary people in northern China during Chinese festivals. Noble states that *yangge* is 'a broad category of Chinese performance referring to a form of dance or stylized movement, singing or chanting, and role-playing with wide-ranging regional variations' (2003: 107). Along with entertainment, *Dongbei yangge* is a major subject in the syllabus of Chinese ethnic and folk dance in dance institutions in China, while the leading pedagogy was developed by the Beijing Dance Academy. Dance students normally learn it for around four to eight years during conservatoire and higher education. The contents of the class have been codified by folk artists and experts in related areas and gradually, and a comprehensive teaching system of *Dongbei yangge* has been formed.

The handkerchief is a significant prop in *Dongbei yangge*. Students hold red, square handkerchiefs and dance with music composed especially for drums, gongs and *suona* etc. Performing with handkerchiefs has many technical requirements. In the training process, it takes a long time to learn how to rotate the handkerchief, throw it, pick it up and how to move the handkerchief from the body and bypass the body during movements. Furthermore, male dancers use multiple handkerchiefs to demonstrate their superb skills, which reflects the enthusiasm of the northeast people. 'Typically, in conservatory dance settings, students learn to use the fans and handkerchiefs and to imitate the types of movements performed by folk artists while walking on stilts [*gaoqiao*], but the stilts themselves are omitted' (Wilcox 2018: 194).

I began to learn *Dongbei yangge* in the first folk dance class I attended when I went to dance conservatoire in 2001. Although I was born in the northeast of China, Jilin province, and

some of my earliest memories involve *niu yangge* with crowds during festivals, the professional *Dongbei yangge* in dance classes were completely different. The speed and step size of the foot movements need to match the twists and rhythms of the upper body. For the use of handkerchiefs, it took a long time to practice specific skills.

1.4 Chineseness and Intercultural Dancing Bodies

In the study of Chinese dance, scholars argue that the pioneers' transcultural experiences contributed to the development of Chinese dance (Jiang 2008, Xu 2014, Wilcox 2018 and Zheng 2019). When he returned to China, Wu Xiaobang established 'New Dance' using the methods of modern dance he learned in Japan. His creation influenced generations of Chinese dancers. Learning ballet in London, Dai Ailian brought the systematic training of ballet to China, and developed new methodologies for Chinese dance study. Korean dance artist Choe Seung-hui came to China twice to cultivate the first generation of Chinese dance workers. Studying dance in Uzbekistan and Moscow, Qemberxanim is a leading figure in the development of Chinese ethnic and folk dance.

Transcultural dance exchanges in China had rapid developments after the Chinese economic reform. In 1987, the 'Modern Dance Diploma Course' was set up at the Guangdong Dance School. This degree programme indicated a formal establishment of modern dance education in China, and the American Dance Festival sent instructors to teach the dance techniques of Martha Graham, Jose Limón, Doris Humphrey, and contact improvisation (Zheng 2019c: 360). Teachers from the American Dance Festival cultivated numerous Chinese modern dance students. Fangfei Miao's doctoral thesis has studied the misunderstandings of this cross-cultural project. Miao claims that the misunderstandings have been generated by differing understandings of Chineseness and views concerning 'tradition' in the United States and China (2019). However, this transcultural collaboration has cultivated the first group of modern dance students. 'Some students later became internationally acclaimed artists – Shen Wei, Jin Xing, and Wang Mei' (Miao 2019: ii-iii). I now investigate Chineseness through the notion of intercultural dancing bodies, offering an analysis of overseas Chinese artists Shen Wei and Wen Wei Wang, followed by an analysis of my own dancing body.

In Cheryl Stock's study, she defines four modes of intercultural exchange as 'in-country cultural immersion; collaborative international exchange / sharing of culturally diverse practices; hybrid practices of diasporic artists and implicit intercultural connections' (2018: 344). Furthermore, she points out that 'identity in intercultural dance is a site of ongoing transformation through construction, deconstruction and reconstruction, both conscious and unconscious' (Stock 2018: 345). In the monograph *Akram Khan: Dancing New Interculturalism*, Mitra proposes the idea of 'new interculturalism' from a perspective of postcolonial study, based on a comprehensive study on British-Bangladeshi choreographer Akram Khan's creation. She demonstrates that interculturalism 'represents a conceptual, processual, embodied lived condition driven by one's own multiple affiliations to cultures, nations and faiths' (2015: 15). Ted Cantle, a political thinker and founding director of the Institute of Community Cohesion, argues that the concept of interculturalism is the future, compared to an older political discourse on multiculturalism. He claims five issues which multiculturalism has ignored, including

> Identity as a dynamic concept
> From 'race' to recognition of all other forms of difference
> From national to global/international drivers of difference
> New power and political structures
> An inter-disciplinary approach. (Cantle 2020: n.p.)[12]

In the monograph *The Return Beat – Interfacing with Our Interface: A Spiritual Approach to the Golden Triangle*, Olu Taiwo studies trans-cultural identities from the perspective of philosophy. His idea of a 'physical journal' helps me to understand identity/identities as dynamic concepts of being and becoming.

> Over my life I have researched and observed myself as a reflective practitioner, examining the manifestations between my trans-cultural identities and my embodied ancestral as well as personal memory and knowledge. My being is underpinned by embodied memories derived from lived experiences informed by movements from my body in its process of change. These memories neurologically construct a virtual body, holographically projecting a spatialised memory, helping my living body to write and re-write itself. (2021: xx)

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[12] The key issues quoted here are taken from 'About Interculturalism', Ted Cantle's elaborate website, available at: http://tedcantle.co.uk/publications/about-interculturalism/. The summary texts on Cantle's website are developed from the arguments already published in his earlier books (see, for example, Cantle 2012).

The theories and ideas of intercultural studies inspire me to explore the concept of a choreographer's fluid identities, which indicates that personal experiences, skills and inflections can shape individual style in creations. Having travelled with a heavy heritage, I am now drawing on old and new resources, and some of the latter are barely known to me yet.

1.5 Shen Wei's Dancing Body

Chinese American artist Shen Wei had 'multilayered corporeal training' (Mitra 2015: xii) and his dancing body has absorbed the vocabularies of both China and the West. Shen's intercultural body is visible in his works, and his dance style has changed since he moved to the US in the 1990s. The dance compositions of Shen embody the hybridity of Chinese culture and Western culture. Shen was born in 1968, and his parents were Chinese opera *xiangju* artists. At the age of nine, Shen was admitted to the *Xiangju* Department of Hunan Art School for a six-year training course (Tang 2019: 76). The professional background of training in *xiangju* and *xiqu* enables Shen to equip himself with sophisticated skills of Chinese opera. Learning Chinese calligraphy and ink painting at a young age has given him a deep understanding of Chinese traditional culture. In 1989, Shen began to train in modern dance at the American Dance Festival's programme at the Guangdong Dance Academy in China. 'He later became a founding member of the Guangdong Modern Dance Company, China's first modern dance group, and then continued his training in New York City with the help of a scholarship from the Nicolais/Luois Dance Lab. In 2000 he formed Shen Wei Dance Arts' (Gerdes 2010: 232). The culture shock caught him by surprise, and although it took him a long time to adapt to life there, ultimately, he claims to have received spiritual nourishment from the fresh and unfamiliar North American art forms (Shen 2014).

Shen created his own 'Natural Body Development Technique' (NBDT) after more than ten years of exploring movement. NBDT comprises of a set of body movements developed by Shen and is utilised in his own company Shen Wei Dance Arts.[13] 'The body is actually subject to many limitations. When we mention dance, we think of ballet … But I think dance is a movement – a movement of the body. In this movement system I developed, I use the

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[13] Shen Wei formed Shen Wei Dance Arts in 2000, and has been the artistic director since the company was founded. The company is based in New York City. The work Shen Wei creates for his company draws on influences as varied as traditional Chinese culture and arts, European Surrealism, US-American high modernism, and the ritual power of ancient drama.

body as a tool to explore the energy inside our bodies' (Shen 2013). Shen regards the body as a tool of movement, and is preoccupied specifically by the question of how we use our bodies.

> My dancers study my 'natural body development technique,' a technique I have developed over ten years, along with basic elements of Chinese opera walking and hand gestures. But the work is not tied to Chinese forms any more than it is any other form. It is a new way of seeing movement that comes from an understanding of certain principles such as internal energy, momentum, continual movement, transfer of energy, and internal rotation. (Shen, cited in Gerdes 2010: 234)

NBDT focuses on two aspects: internal space (the human body) and external space (the environment outside the body). The internal space includes the use of breathing and inaction in Chinese philosophy, which helps him imagine the status of the inner body space; this also helps with the making of, and motivation behind movement decisions while constructing his body wisdom. The relationship between body and atmosphere and how Shen views physical interaction with space are all examined from NBDT.

Qi (气) is a philosophical idea adapted by Shen in his movement developments regarding the exploration of inner-outer energy. In Taoism, *qi* is the most important concept of internal energy. It echoes throughout various aspects of traditional Chinese culture. 'Chinese traditional medicine, including acupuncture, seeks optimal flow of *qi* throughout the body' (Gerdes 2010: 239). Patients are diagnosed and treated with traditional Chinese medicine based on their *qise* and pulse; cupping drives out *hanqi*, *shiqi* and makes *qixue* flow smoothly. 'Moreover, the concept of physical circulation and transformation of *qi* is particularly important in dictating the movement of Chinese martial arts and meditative techniques, such as tai chi chuan and *qigong*' (Gerdes 2010: 239-240). *Qiyun* is reflected in the writing process of Chinese calligraphy, emphasising the establishment of rhythm and imagination. Other dance companies and higher education institutions in China, like Shen's NBDT, focus on the cultivation of *qi* in their training programmes. For instance, the awareness of *qi* flowing through the body has been emphasised by Gao Yanjinzi, the artistic director of Beijing Modern Dance Company, while leading daily training classes for dancers. *Tai chi* and *baguazhang* are included in the syllabus of the Beijing Dance Academy to provide training for students to exercise and understand the concept of *qi*. I noticed that some dance students combined the understanding of *qi* in their choreographies and movements.

Qi, in my technique, is different from either the traditional Chinese breathing or the breathing methods of Chinese folk dance and *xiqu*. I explored my own breathing method, but this entry point was related to traditional Chinese culture. *Huxi* (呼吸) and *qi* are extremely important. *Qigong*, martial arts, *xiqu*, and dance all have the existence of *qi*, but the *qi* I studied was different. Because I have been to Tibet for several times and done some research after I came back. I also have a relatively good understanding of body structure, and I often practise meditation and *yunqi* (运气, the transmittance of *qi*), so I re-developed my perception of *qi*. *Qi* is a basic function of the body, which affects the movement and the state of the body. (Shen, cited in Zhang 2018)

Cloud Gate Dance Theatre teaches *tai chi* to their dancers so that the dancers can sense the existence of *qi*. Huang Hsu-Hui, a former principal dancer and master teacher of Cloud Gate Dance Theatre, explains that '*tai chi* requires a calming of the inward state and a subsequent awareness of *qi* energy before the initiation of movement by the physical body' (cited in Gerdes 2010: 239). Shen's NBDT starts with stillness and feeling shifts of *qi* in internal space, which is similar to *tai chi*. The interaction between the body and the external environment is triggered when *qi* reaches a certain degree. This is how the movement phrases naturally arise and develop. Dance scholar Wen-chi Wu connects the notion of *qi* to the influence of *yin/yang* on dance movement. 'The Chinese traditions conceived of the *yīn/yáng* relation as the nature of movement. In the context of dancing, the dancer and the dance exist not as a lived body-of-motion, but as a lived body-of-*qì*, cyclically and interactively embracing both stillness (*yīn*) and movement (*yáng*)…the movement of dancing is intrinsically the motion-of-*qì* rather than the physical body-of-motion' (Wu 2005: 209-210).

NBDT is the embodiment of Shen's intercultural dancing body. This technique combines the Chinese philosophy of *qi*, *yin* and *yang*, and contemporary dance techniques. The techniques of Martha Graham, Jose Limón, Doris Humphrey, and the contact improvisation he learned in the program of modern dance in Guangdong in 1989 influenced NBDT. The living environment in the US and the different cultures made Shen consider Chinese culture from a contemporary transexperiential viewpoint. [14] I argue that Shen's intercultural identity contributed to the construction of NBDT and his creations over the years.

Second Visit to the Empress (2005/2007), with direction, choreography, set, costume and make-up design by Shen, is one of his intercultural dance works. 'The opera training of his

[14] The cultural 'transexperience' term is derived from Chiu (2003), see above.

childhood still inspires him, as is evident in his work *Second Visit to the Empress,* which combines Chinese opera with modern dance' (Gerdes 2010: 232). He synthesised contemporary dance and opera but kept them independent from each other, so that the dance performance and the opera performance coexist on stage as two independent but interconnected elements. In this way, although the relationships between opera and Shen's contemporary technique are not made explicit, the audience, upon seeing these two forms happening at the same time onstage, can draw their own conclusions while watching the performance. This is a connection between Chinese opera and contemporary art forms. The contemporary dancers on stage are like the opera dancers without costumes. They are the same people, but perform two separate roles in the same space simultaneously.

Chinese culture inhabits Shen's dancing body, and this culture is significant in his life abroad. Shen addresses his love of the ancient Chinese language, *wenyanwen* (文言文), and traditions.

> In fact, although I did not deliberately emphasise my Chinese identity, in my subconscious, Chinese culture has a particularly deep influence on me. Anyhow, it will never be completely absent from my work. I am very much fond of Chinese traditional culture. Even if I make a purely Western work, Chinese culture has already manifested itself in my identity recognition subconsciously and is reflected in the work. Whether dancing or painting, I love the oriental aesthetic concepts, which cannot be completely separated from my creation. I also like some of the Western aesthetics and artistic works, but I am more affectively attached to the East. A decade of Chinese opera training in my young age and the study of Chinese traditional painting have had a deep influence on me … These things exist in my aesthetic consciousness. As I grow older and experience more and more, I feel that these things become more and more important in my life. So I created *Second Visit to the Empress* and used Chinese culture. It seems that I deliberately used *xiqu* in this work, but I did not. This kind of Chinese aesthetic consciousness has always been in my body. (Shen, cited in Zhang 2018)

Fig. 1. *Second Visit to the Empress* (2005/2007) by Shen Wei. © Photo: Briana Blasko and Shen Wei Dance Arts.

1.6 Wen Wei Wang's Dancing Body

Wen Wei Wang is a Chinese Canadian artist who has been trained in Chinese classical dance, folk dance and ballet since he was twelve years old. His professional dance training began when he started in Lanzhou Army Song and Dance Ensemble as an apprentice and eventually graduated in choreography from the People's Liberation Army Academy of Art,[15] which is one of the most famous higher dance institutions in Beijing. Wang attended a summer programme at Simon Fraser University in 1991, then joined the Judith Marcuse Dance Company as a dancer, followed by seven years of dancing with Ballet BC (Wang 2021).

> In 2000, he received the Clifford E. Lee Choreographic Award and since then has choreographed for the Alberta Ballet, Ballet BC, Ballet Jorgen, North West Dance Projects, the Vancouver and San Francisco Operas, and Ballet Jazz de Montreal. Wang received the 2006 Isadora Award for Excellence in Choreography, the 2009 Rio Tinto Alcan Performing Arts Award, the 2013 Chrystal Dance Prize, and a

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[15] In 2017, the People's Liberation Army Academy of Art changed their name to The Military and Cultural Institute, National Defence University PLA.

2013 RBC Top 25 Canadian Immigrant Award. In 2003, he founded Wen Wei
Dance and has since choreographed eleven full-length works for the company.
(Wen Wei Dance website)

Wang's creations are the embodiment of his intercultural identity as a first generation Chinese
Canadian immigrant, and his works feature symbols of the East meeting the West. A few
years ago, Wang created the work *Dialogue* (2017) explicitly to explore identity and isolation.
This work was performed by five male dancers, Dario Dinuzzi, Ralph Escamillan, Andrew
Haydock, Arash Khakpour, and Justin Calvadores. The performers had different backgrounds:
Canadian, Italian, Filipino Canadian and Tehrani, and varied training backgrounds in ballet,
contemporary dance, breakdancing and jazz dance. 'In *Dialogue*, I aim to recruit dancers with
varied backgrounds and to explore the concepts of identity and communication' (Wang 2021).

During rehearsal, Wang asked the dancers, 'Where are you from? Where did your parents
come from? Where did your grandparents come from? What do you speak at home' (Wang,
cited in Smith 2017). This method was used during the process of dance composition, but I
think these are also important questions Wang asked himself many times. In *Dialogue*, Wang
and his dancers probed the questions together. '*Dialogue* explores the basic desire to be
understood, and the loneliness when one does not achieve those rare, honest connections with
others. *Dialogue* strives to break down the sophisticated and artificial systems of language
and technology to examine the universality of communication and of our collective
experience' (Wen Wei Dance website). As an immigrant, when Wang arrived at Simon Fraser
University, life must have been difficult due to needing to switch between two different
languages, Chinese and English. 'In rehearsals and dance classes, language restrictions may
not be the biggest problem. But in leisure time, not having the ability to express personal
feelings in English made me suffer for quite a long time' (Wang 2021). I understand this
feeling. When I moved to London to study at the University of Roehampton in 2016, I could
only speak limited English. Culture shock, challenging teaching materials, and the unfamiliar
living environment made me feel isolated. Like Wang, I was keen to talk to people around
me, but I could not express myself properly. These kinds of feelings were explored in
Dialogue alongside cultural identity. 'I learned I'm not an outsider; I learned, don't worry
about your language if it's not perfect or if you look different. Let's share our different
cultures. Let's celebrate' (Wang, cited in Smith 2017). Smith's interview with Wang reveals
that Wang had found the answer. People have different cultures, languages, backgrounds, and

experiences, but the site constructed by dancing bodies is a shared environment. Dancers can understand each other even though they speak different languages. Wang's technique and choreographic style are not the same as Chinese classical dance or Chinese ethnic and folk dance. I can see the tracks of ballet, contemporary dance, and Chinese dance, but I argue that it is Wen Wei Wang's dancing body that offers something different. His style is hybrid and unique.

Fig. 2. *Dialogue* (2017) by Wen Wei Wang. © Photo: Chris Randle, Wen Wei Dance.

Made in China (中国制造) (2015) is another dance work created by Wang along with artists Gao Yanjinzi, Sammy Chien and Qiu Xia He who have Chinese training backgrounds. *Made in China* explores the commonality of the artists' Chinese heritage. Gao, artistic director of the Beijing Modern Dance Company, trained professionally in Chinese dance and modern dance in Beijing. He is a Chinese Canadian musician who moved to Vancouver in 1989 two years earlier than Wang. Wang and He were both born in Shanxi province, China, but they did not meet until they collaborated for *Made in China*. Chien, a Taiwanese Canadian, is a video

and sound artist. Chien is 'the only person on Canada's West Coast who is an official Isadora instructor' (SFU website 2021).

Fig. 3. *Made in China* by Wei Wei Wang, Gao Yanjinzi, Qiu Xia He and Sammy Chien, premiered at the Banff Centre for the Arts, Canada, 31 January 2015. © Wen Wei Dance.

I would argue that the common ground between the four artists is the exploration of Chineseness through dance, instruments, and digital technology. Wang is not a choreographer with expertise in technology, but he keeps an open mind to the unknown. In this work collaborating with Chien, I saw Wang in two different stages of his life, the current Wang moving on the stage and the Wang in his childhood, and, then, the dialogue between them (see Fig. 4). Chien used a live camera in front of the stage to capture Wang's live movements and this digital design stimulated my imagination when I watched this work. I told Wang my perception about the scene in our interview, and he smiled.

> I create works based on curiosity and interest. I will not choose to please audiences and study what kind of works audiences might like, but follow my own curiosity at every stage. In the end, the presented works need to stimulate the imaginations of the audience, which is what I care about. After the performances, I am not interested in looking at audience reviews. (Wang 2021)

Fig. 4. Wang's solo working with digital artist Sammy Chien in *Made in China*. © Wen Wei Dance.

I am curious about how Wang perceives Chineseness and his dancing body after living in Canada for thirty years.

> The blood in my body and the colour of my skin cannot be changed. My favourite food is still the home dishes made by my mother. I accept these, and this is my identity. My creation is different from other choreographers in Canada because of the Chineseness in my style. We cannot only look at Chinese arts, culture and history in the present and over the past fifty years. We should look further at calligraphy, painting and poetry in the Han, Tang and Song dynasties. I absorbed these art forms in my creation. (Wang 2021)

I asked Wang: Chinese, Canadian, hybrid or intercultural? He responded, 'interculture' (Wang 2021). Stock points out that 'many intercultural artists draw on their diasporic experience of living in two or more cultures simultaneously, or living between cultures, to create new performance vocabularies which reflect their particular aesthetic and creative landscape' (2018: 348).

Fig. 5. Interview with Wen Wei Wang on 12th April 2021. Photo: Zhi Xu.

Wang started his position as artistic director of Ballet Edmonton in September 2018 in addition to running his own dance company for the past 17 years. Wang has 'a vision of Ballet Edmonton as a more integrated player in the Edmonton arts scene. He hopes to foster more connections and collaborations with local musicians, and the company has opened its classes to the public for the first time in its history' (Stashko 2019). In Wang's latest creation, *Flying White* (飞白), he worked with thirteen live musicians on stage to explore his insistent curiosity in Chinese calligraphy. Wang, an outsider, has become an insider. In-between two cultures, Wang cannot be easily defined by a single culture, and his intercultural identity can be found in his creations. 'After thirty years living in-between the cultures of China and Canada, what I have been doing is to be myself' (Wang 2021).

I was born in a different era from Shen Wei and Wen Wei Wang who grew up during the cultural revolution. But we have all trained in Chinese dance, and now live abroad. Like Shen and Wang, I also think about my cultural identity in my creations and dance works in the following discussion.

1.7 My Own Dancing Body

Starting out in 2001, I went to a dance conservatoire at the age of 12 where I underwent professional training in Chinese classical dance, folk dance, ballet, classical technique and repertory. It was a dance school with strict rules and regulations. Students were only allowed to go out of school once per week, on the only day training was not required. It was actually a precious reward for a teenager, particularly for a dancer who had to obey serious training routines and dietary requirements every day. Except for the day off, I had to wake up at 6 am and engage in one hour of physical exercises, normally including running and stretching under the observation of tutors. Following breakfast and washing, dance classes were conducted from 8 am to 9 pm, excluding one-hour of lunch time and three breaks. In the conservatoire, dance technique was a significant feature of the training included in nearly every warm-up part of the courses during the day. This was a normal training routine for any child between 10 and 12 years old who wanted to become a professional dancer in China.

The doors to the world of dance opened up to me as a result of this strict training system. Every day was a hard but colourful one in which I could learn different dance genres, from classical and folk dance to ballet. Teachers demanded a high and uniform standard level of physical and mental attainment from students in the classroom. Unification was the only aesthetic requirement. A positive aspect was that this training method formed my physical capacity and furnished the means by which I utilised to become a professional dancer. However, the same aesthetic standard can damage creativity, personality and individuality in teenagers.

After this strict pedagogy, I realised that my body shape and my awareness of muscles changed gradually. To be more specific, my body became more sensitive to rhythms due to more than twelve hours of daily training. Furthermore, I could feel the emotional change

embodied by the dancing body in music and the energy flowing in a space. In terms of my body capacity, I could complete a series of complex techniques and presented skilled poses that are difficult to achieve for untrained people. These changes made me excited and I continually explored my skilled dancing body.

My own dancing body was absorbing both Chinese classical dance and Chinese ethnic and folk dance, which left traces in my movement. For example, I intended to think about the power of inner energy and breath while going through the movement in circles. Folk dance focuses on the feet's flexibility. Therefore, I paid lots of attention to feet movements in choreography. The positions and movements of feet embody the emotions of performers. For Chinese ethnic and folk dance, I trained systematically in *yangge* for around 7 years, including *Dongbei*[16] *yangge* (*Northeast yangge*), *Shandong*[17] *yangge* (*Haiyang yangge, Drums yangge, Jiaozhou yangge*) and *Anhui Flower Drum*. However, what made me most interested and dedicated was the *Dongbei yangge* and *Shandong yangge*. Interestingly, my lineage also comes from these two regions of Dongbei and Shandong. My father's side of the family is from Northeast China, and my mother's is originally from Shandong. Throughout my life of learning dance, *Dongbei yangge* and *Shandong yangge* have coincidently co-existed in my dancing body.

I first encountered American modern dance while pursuing my bachelor's degree in choreography at Beijing Dance Academy (BDA). The syllabus of choreography at BDA consists of modern dance techniques, choreography, improvisation, contact improvisation, *tai chi, baguazhang*, folk dance and tap dance. The major course in modern dance techniques included the Graham, Limón, and Cunningham techniques, and 'fall and recovery' by Doris Humphrey. These training methods offered further opportunities for my dancing body as they incorporated the diverse training systems from China and the US, forming a rethinking of the ways of moving. I could feel that the sensation of the surrounding space and the energy of my body had changed. I could feel my breath flowing through my entire body when I moved, and the energy of my inner and outer body. My moving body could change immediately according to the surrounding space, and the volume of my body could be either still or loud.

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[16] Dongbei (东北), or Northeast China is a geographical region of China, including Liaoning province, Jilin province and Heilongjiang province.
[17] Shandong (山东) province is part of Eastern China.

I was fortunate to obtain an offer from the Beijing Modern Dance Company (BMDC) after graduating from the BDA in 2008, becoming a choreographer and dancer with another 11 colleagues who had more than ten years of training. The BMDC, established in Beijing in 1995, is one of the earliest modern/contemporary dance companies in China. This company works with artists from around the world, and these occasions of international cooperation enriched my field of vision.

Under the Skin was a cooperating project by Wen Wei Wang, artistic director of Wen Wei Dance in Canada, and Gao Yanjinzi, artistic director of the Beijing Modern Dance Company in China, which premiered at the Canada Dance Festival on the 12th of June 2010. 'A dual investigation into the common ground shared by performers from Canada and China, *Under the Skin* is a challenging work that examines ideas of cultural and personal identity, from the inside out' (Wen Wei Dance website). As a choreographer and dancer at the Beijing Modern Dance Company from 2008 to 2012, I had the opportunity to work with Wen Wei Wang in the collaboration for *Under the Skin* from 2009 to 2011. Unlike the previous international tours I had done before, working with the Wen Wei Dance company was impressive. The two companies worked in dance studios and on stages, but we also lived together when we toured in Canada and China. This intercultural dialogue during the cooperation and afterwards influenced my own dancing body.

Standing on the same stage, numerous questions appeared in my mind. What is cultural identity for a dancer? Why our dance styles are different? Meanwhile, I noticed the different preferences regarding narrativity in choreography between China and Canada. During the rehearsal, dancers from BMDC preferred complicated techniques to express compared to dancers from WWD who chose emotional movements which might not normally be considered traditionally 'beautiful'. Why did they move like that? Why did they not demonstrate physical skills on the stage? These questions constantly occurred to me during my creative process.

Fig. 6. *Under the Skin* performed by Zhi Xu, Scott Augustine, Minda Liu, Josh Martin and Chao Li. 2011. ©
Photo: Li Zhiguo.

During the collaboration with Wang in *Under the Skin*, he gave me motifs to develop which were not familiar to my dancing body, as a Chinese dancing body. I felt these motifs were 'strange' and could not express them even with my skilled dancing body. He asked me to improvise and always preferred the movements which I did not expect him to like. In my choreography, I prefer fast and jumping movements which present my body technique. But Wang recognised my detailed dancing body, even in moments it was still. He told me he liked my technical movements, but he was keen to see my characteristics, who I am when I stand on stage.

After one year of working with the international dancers from WWD, I felt some new elements growing in my dance compositions. I learned street dance from Josh Martin, a dancer from WWD, and other individual techniques during the rehearsals for *Under the Skin*. I observed during rehearsals how WWD dancers created and moved. We talked about cultures, films, boxing and extreme sports. I also tried toasted marshmallow for the first time when we performed at the Banff Centre. All these experiences influenced how I move and choreograph.

Fig. 7. *Under the Skin* by Zhi Xu and Tiffany Tregarthen on *The Georgia Straight* newspaper, 2011. Photo: Zhi Xu.

After working for eight years being based in Beijing, I came to London to pursue a Master's Degree at the University of Roehampton in 2016. I was eager to start a new adventure and continue exploring the potential of my dancing body. 'Where are you from', is the question that arose when I made new friends, met classmates, and paid my bill at supermarkets. Since then, I have thought about the question regularly from the perspectives of race, culture, geography, religion, and my dancing body. I attended Limón classes with BA students at Roehampton, and I have sought intensive courses from a variety of dance companies over the past few years during my stay in the UK.

Gaga is an emerging type of training for professional dancers. Gaga was created by Israeli choreographer Ohad Naharin, the artistic director of Batsheva Dance Company in Tel Aviv, Israel, and this methodology is significant to dancers in the study of embodiment. Naharin is one of my favourite artists. I was selected to participate in one week of Gaga Intensive Class at Rambert in April 2019 after I submitted my CV and portfolio. Most morning courses were led by Naharin himself; classes in the afternoon and repertoires were led by other Gaga teachers including Ian Robinson, Adi Zlatin, and Chisato Ohno. This intensive training provided me the opportunity to observe international dancers and explore my own body using the Gaga method.

'Don't plan everything, be available'; 'put thoughts outside your brain, then move'. In morning classes, I moved my body along with others under Naharin's guidance. He asked us to move looking at the moment, and no other requirements were needed. 'Gaga does not change the gene of a people, but it opens up the engine of the body', Naharin said. Gaga provided methods to realise my body, which is helpful in order to forget outdated dance techniques and to realise the body's current sensations. 'Gaga is not about inventing new things, it's all about discovering what's already there … We are not going to teach you something new, but to help you open up something that is already within … [the] ability to go beyond … [to] be sensitive and take care of your surroundings' (Naharin, in Sanger 2019). The method of Gaga is helping movers to realise what they have, and the technique helps them expand the technique of their dancing bodies and also how to control it. Like Gaga teacher Ian Robinson said, 'Gaga is not a technique, but a tool box which can help you to exaggerate power from your own knowledge' (2019).

'Pull your bones away from your flesh', 'float', 'shake', 'quake', 'pika', and 'yoyo', all these terms were repeated by instructors every day. 'Float' is one of the most significant metaphors in Gaga. It is the dynamic and individual sensation of your own body in the environment. 'The word "float" has a common cultural and linguistic meaning to which all dancers relate. Likewise, all dancers enter into a dialogue with an intuitive sense of the metaphor and actualize it physically, and therefore individually, in their own bodies' (Katan-Schmid 2016: 47). From Einav Katan-Schmid's statement, the concept of 'float' is a metaphor for embodying a picture situated in your own body. It is personal and variable. After training courses in the mornings, Gaga teachers taught dancers the Batsheva Dance Company's

repertoires. I recorded my dancing body daily as data so I could examine how my movements change and understand the body.

On the last day of the training, I had the opportunity to talk with Naharin. He said 'Gaga absorbs other "languages" from *tai chi,* ballet, animals' behaviour, texts, and materials' (2019). In my understanding, Naharin learned from what he saw and perceived in life, and there is no border between his body and Gaga. This conversation inspired me, and also forced me to rethink the complexity of ideas attaching to techno-choreography as an absorption process with borders (interfaces) – an evolutionary process in which embodied knowledge is not a stable heritage that grows and sustains itself but an ever-emergent dislocation and relocation of the senses in dialogue with environments. My dancing body is changing and evolving as I am experiencing each day. Conversations with people, observing nature and weather, all these bring me new insights. My dancing body is ongoing, continuous. The Chineseness is still living in my body, as it mixes with others. In Taiwo's autography, he eloquently argues that all of a performer's gestures and events are a process of untangling feelings and thoughts that are part of an interior experience which relates to that person's 'being' (Taiwo 2021).

1.8 Summary

In this chapter, I framed Chineseness from the perspectives of Chinese dance and intercultural dancing bodies. Chineseness is inherited and developed by exploring Chinese culture through the artistic genre of Chinese dance. Through the examination of Shen Wei's and Wen Wei Wang's intercultural dancing bodies and the reflection on my own dancing body, as I moved from China to England and performed in touring productions in North America, I argued for '[i]dentity as a dynamic concept', as Cantle points out in the study of interculturalism, not solely labelled by race or skin colour, especially for choreographers and dancers (2020: n.p.). Their identities are formed according to the hybridity of their inner world which is built up by training, dancing experience, learning different cultures and techniques, and the outer world which is the environments they engage with. These intercultural experiences form their 'hybridised aesthetic' (Mitra 2015: 16) in their creations. Dance workers often 'have a hybrid cultural identity' (Bannerman, cited in Smith 2013: n.p.).

Chinese dance contributes to dancing bodies' unique aesthetics, like how to use *qi* and the concept of *yuan* in movements. It teaches dancers how to utilise Chinese philosophy in moving. Training background is significant for dancers, and the body's memories cannot be erased for dancers trained professionally with Chinese dance. Intercultural environments trigger Chinese dancing bodies abroad to hybridise Chinese dance techniques with contemporary international dance techniques. The hybridity will generate a new personal style in their dance compositions.

Dancing bodies should keep an open mind, embracing different cultures, races, geographies and mentalities as dancing bodies learn new 'languages' every day from the environments they are involved and interfaced with. Dancers' identities are dynamic according to how mindful bodies absorb new things. I would like to use a metaphor to define an intercultural dancing body. The dancing body is like a transparent container filled with mineral water at the beginning, but adding red tea, black tea, and mint tea into the container changes the colour and taste of the liquid. Training background is like the mineral water, which is the foundation of a dancing body. New cultures and life experiences are the red tea, black tea, and mint tea you engage with. When you absorb new ingredients, your dancing body has more taste, generating a new flavour according to your own intention and responsiveness. I argue that Chineseness is a major taste and the core ingredient for the intercultural choreographers I have examined in this research. Particular epistemic locations, as it was suggested in Spatz's idea of 'choreography as research' (2018: 68), have also affected physical, formal and social techniques:

> A merely organic choreography would be a direct continuation of the past, a lineage of pure authenticity. On the other hand, a merely syncretic or constructed choreography would lay no claim to a real material substrate. A language that is both organic and syncretic draws on multiple sources in order to produce something genuinely new. Neither collage nor continuation, it amounts to a substantive discovery of new possibilities – in a word: research. (2018: 80)

The forming process of an intercultural dancing body is unpredicted, as it inherits from 'a direct continuation of the past, a lineage of pure authenticity', but the mindful body learns new languages through transexperiences.

Chapter 2. Techno-Choreography

2.1 Reviewing Dance and Technology

Engineers and choreographers first collaborated in the 1960s, and methods and special considerations of choreography have been constantly expanding ever since. Digital technologies which intervened in dance compositions were rich and varied. These works are still significant in the field of dance technology nowadays, and historically, many of them are perhaps indebted to a path-breaking experimental series of concerts arranged by Bob Rauschenberg and Billy Klüver – *9 Evenings: Theater and Engineering,* which enthralled more than 10,000 people at the Park Avenue Armory in October 1966 (Salter 2016: 220; Birringer 2008b: 75) with a deep dialogue between artists and engineers.

In the wake of this event, and emerging gradually in the 1980s and 1990s, artists such as Merce Cunningham, Bill T. Jones, William Forsythe, Yacov Sharir, Ellen Bromberg, Susan Kozel, Johannes Birringer, Robert Wechsler, Wayne McGregor, Lisa Naugle and Alexander Whitley, and companies such as Igloo, DAP-Lab, K-danse, Palindrome, Troika Ranch and Adrien M & Claire B have explored the fusion of choreography and digital technologies, cooperating with computer engineers, sonic artists and installation designers. The experiments created by these artists utilised 'the computer for the invention and visualization of new movement possibilities' (Birringer 2008b: 9), and some remarkable works appeared towards the turn of the century, such as *Dancing with the Virtual Dervish* (1994) by Diane Gromola, Yacov Sharir and Marcos Novak; the motion-capture-based work *BIPED* (1999) by Merce Cunningham and OpenEnded Group; the digital art installation *Ghostcatching* (1999) with Bill T. Jones; *Improvisation Technologies* (CD-ROM 1999) by William Forsythe; *CO3* (2002) by Company in Space; *Winterspace* (2003) by Igloo; *16 (R)evolutions* (2006) by Troika Ranch, *UKIYO* (2010) and the later *metakimosphere* series (2014-17) by DAP-Lab.

Technology offers enhanced capabilities to choreography, allowing dance practitioners to extend their ideas on how to work with physical and virtual spaces, and with dancing bodies. But in this research, I present methods with which choreography also offers improved capacities to technology through my practice works. The dialogue between real bodies and virtual bodies creates new meaning for spectators. Dancing bodies are extended, and real

bodies may no longer be necessary in digital performances. Digital technology opens the door to choreographers and dancers to explore performing spaces, the process of dance making, the embodiment of bodies, choreographic methods and the archiving of dance works. The stimulating factors of digital performance for dance artists are continually increasing in the twenty-first century.

One of the leading dance-technology artists and theorists, Johannes Birringer, argues that:

> Digital performance is not a screen-based medium. Rather, it is characterized by an *interface structure* and computational processes that are integral for composition, evolving content, aesthetic techniques, interactive configurations and delivery forms. In many instances, the integration of human-machine interfaces implies the design of interactive systems, with 3D motion sensing set ups (for example Kinect) or wearable instruments that control real-time synthesis of digital outputs. Installation architectures compete with the stage – contextual design of programmable systems becomes a new form of architecture, protocol, and bio-informatic space. (Birringer 2018: 465)

According to Birringer, interface structure and computational processes are core to digital performance. The concept of digital performance goes further than the notion of screen dance. Utilising software, projection, web-camera and a sensor kit in dance projects affects the form of the performances. The construction of interactive interfaces is another vital consideration in the process of performance making.

In the monograph *Digital Performance: A History of New Media in Theater, Dance, Performance Art, and Installation*, Steve Dixon demonstrates that:

> We define the term 'digital performance' broadly to include all performance works where computer technologies play a *key* role rather than a subsidiary one in content, techniques, aesthetics, or delivery forms. This includes live theater, dance, and performance art that incorporates projections that have been digitally created or manipulated; robotic and virtual reality performances; installations and theatrical works that use computer sensing/activating equipment or telematic techniques; and performative works and activities that are accessed through the computer screen, including cybertheater events, MUDs, MOOs, and virtual worlds, computer games, CD-ROMs, and performative net.art works. (2007: 3)

Both Birringer and Dixon have discussed the central position of computer technologies in digital performance. The application of computational processes in performance determines the aesthetics and perceptions of the work. Performance makers need to understand the digital (or algorithmic) and its relation to the elements of movement creation, lifts, props and costumes, since a choreographer's knowledge alone is no longer enough in digital performance. Due to this, 'An increasing number of higher and further education courses around the United Kingdom are offering training in combinations of digital media and performance, producing practitioners who can speak both languages' (Popat 2006: 147).

Equipping themselves with digital knowledge is important for dance workers. Popat argues further that 'Collaboration seems to be an increasingly prominent part of this to explore the possibilities from all sides. However, it is not essential, and many off-the-shelf packages allow artists to play without a great deal of technical skill. This still requires the artist to have sufficient knowledge and vision to see the potential inherent within the technology, either in playing with its intended usage or subverting it for artistic purposes. As an increasing field of good practice emerges, artists will have a wider experience on which to draw' (2006: 147). Dance artists enhance their capabilities through constant practice. The new generation of dance practitioners are familiar with the digital world. Generation Y[18] and Generation Z[19] were '"born digital" and have grown up with pervasive computing, wearable smart technologies and a torrent of images' (Birringer 2018: 467). The digital world is familiar to dancers from these generations.

A very significant part of our understanding of dance technology is movement interconnected to software programming which provides wide-ranging acoustic and visual possibilities for choreographers and dancers. Examples of some software used include: *Very Nervous System* (created by David Rokeby in the early 1980s), Max/MSP (by Miller Puckette in the late 1980s), BigEye (by Tom Demeyer in the 1990s), EyeCon (by Frieder Weiss), MidiDancer (by Mark Coniglio) and Isadora (by Mark Coniglio and Mort Subotnick) (deLahunta 2005; Dixon 2007). Dance scholar Scott deLahunta comments that 'the emergence of the Internet in the form of the World Wide Web in the early 1990s increased the dissemination of these software

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[18] The generation born in the 1980s and 1990s, and typically perceived as increasingly familiar with digital and electronic technology.

[19] The generation born in the late 1990s and 2010s and perceived as being familiar with the Internet from a very young age.

tools and now artists are customizing them to some degree, creating tools within tools, and sharing these developments with others' (2005: 31). Today, Max/MSP and Isadora are still essential software for practice-based researchers working in digital performance. A relatively user-friendly manipulation of these software programmes is helpful for dance workers who might not be equipped with professional knowledge of coding and computer science, but who can still play and experiment with them. As deLahunta points out in regard to Coniglio's programming environment: 'named after the renowned early twentieth-century modern dance pioneer Isadora Duncan, Isadora was designed for use by a non-specialist after only the briefest of introductions, placing the control of the creative software tools in the hands of the dancers themselves' (2005: 32).

The processes of technology-intervened dance composition have attracted scholars' and artists' attention for more than two decades now. The research project *Choreographic Objects: Traces and Artifacts of Physical Intelligence* was led by James Leach, Scott deLahunta and Sarah Whatley, a series of workshops involving dance artists William Forsythe, Siobhan Davies, Wayne McGregor and Emio Greco|PC in 2008-2009. The intention of this project was to articulate and disseminate choreographers' ideas and the process of creations (Blades 2015). Similar to *Choreographic Objects*, research projects such as William Forsythe's *Improvisation Technologies* and *Synchronous Objects*, and Anne Teresa de Keersmaeker's *A Choreographer's Score* 'have been valued for their potential educational benefit, as a reference for interdisciplinary research, discussed critically by performance scholars and taken as a stimulus for other artists and designers' (deLahunta and Jenett 2017: 64).

Along with *Choreographic Objects,* the projects of *Motion Bank* and *Choreographic Language Agent* are continuously engaging with research into movement generation, digital notebooks for choreography and software-based choreography. Digital artist Susan Kozel moved her research towards mobile technology in recent years, calling it 'social choreographies', which she considers as 'artistic research methodologies relevant to this newly framed domain that are rooted in improvisatory studio practices and drawing a choreographic sensibility into urban environments' (2010: 137). These tools not only improve productivity during dance making, but also help dancers to learn repertoire more conveniently nowadays.

2.2 Dance and Technology in China

In the late 1990s, dance technology emerged in China through choreography and camera work. The initial experimentation was started from a dance website established by Liu Chun, Xiao Xiangrong and Xu Rui who filmed dance movements and utilised computer applications to process choreography. Liu Chun, a practice scholar at the China Academy of Art, has published two monographs, *Dance and Media* (2010) and *Dance of Hallucination* (2012)*,* which are significant pieces of Chinese literature, in terms of both dance and the digital. His research opened the door to dance workers who are passionate to know about new technology in performance.

In comparison with the significant amount of literature published in English by Birringer, deLahunta, Dixon, Popat, Kozel, Salter, and Whately in the UK and the US, dance technology research in China requires more scholars to work on it. Some papers have now been published in Chinese by Zhang Zhaoxia, Li Qing, Tian Tian and Yuan Yi, and choreographers including Xiao Xiangrong, Liu Xiao, Wang Jiaming, Li Qing, Li Chao, Wang Jiaming and Tian Tian have turned their attention to digital performances in the past decade.

Liu claims that dance and technology have developed fast since 2008 (2010). Due to the *Beijing Olympic Games Ceremony* in 2008, choreographers have realised the powerful visual effects that digital technology can provide. The use of projection and digital images have since reached a very high level both in theatres and site-specific performances. The opening ceremony was an important platform to present the culture and technological advancements of China to the world. The creative team used the world's most advanced projection equipment, the most innovative video production groups and experienced artists. Liu points out that after 2008 the rapid development of imaging technology at evening events, shows, sports, and theatres was unexpected. Whether it is an outdoor large-scale performance or the exploration of a small theatre, digital images have been used in a variety of visual innovations. The popularity of projection, animation and holography has been achieved at an incredible speed (2012).

Kongkong Dance Studio (KDS), established by Xiao Xiangrong and Liu Chun in 1999, is the first group exploring dance and media in China (Liu 2012). This period marked the beginning of dance meeting technology in China. *Thirsty* (2002) was the first work by KDS. This 30-

minute work utilised camera, projection and props, constructing multiple layers of performance spaces. In this work, dancers were also the operators during the performance. They were moving and using cameras to shoot the puppet on stage in order to test the potential of dancers, water, a puppet and the figures through the projection. Improvisation was mainly used in this work to interact with video feedback effects through the camera. *Thirsty* was also presented in the South Korea Bamboo International Arts Festival, which was organised by Sin Cha Hong, a notable modern dancer and choreographer.

Another work by KDS is the screen dance *Umbrella* (2002), in which Liu and Xiao cooperated with contemporary dancer Wu Zhenyan. This project used one red umbrella and long lenses to explore the relationship between the dancing body and screen. It won a silver medal in the *Second CCTV Dance Competition* in 2002. The dance *Q* (2006) is a duet work by Liu and Liu Yongxia, which explores the roles of performers (on the stage) and manipulators (off stage working with computers) in the digital. It is a meaningful experiment in dance technology. Liu is moving on the stage, but simultaneously manages to adjust patches on the computer. This work provoked significant research towards dance technology in China, especially from the perspective of choreography. In the digital environment, the work of choreography is not only codifying movements, but also coding digital images and generating illusions. Exploring something that bodies cannot complete without technology is a meaningful experimentation in dance technology. Liu and Xiao, the first generation exploring dance and digital media from the perspective of choreography in China, made valuable contributions with their work. Liu commented, 'I am not an expert in technology, but interested to try the context which is provided by technology. Exploring the potential of digital media is vital in my creation' (2012: 81).

Xihe Jianqi (西河剑器) ('*Xihe* Sword' in English), which premiered at the National Centre for the Performing Arts of China in 2019, is a live interactive dance directed by Liu that explores the sword dance discipline in a digital environment. Tian Tian, the choreographer of this work, is a *Han-Tang* dancer who learned from the founder of *Hang-Tang* classical dance, Sun Ying, whom I examined in the previous chapter. She completed her doctoral research into the forms of Chinese classical dance at Peking University in 2015, and in recent years has turned her attention to dance and digital media. The work is performed by Tang Shiyi, who graduated from the department of Chinese classical dance at Beijing Dance Academy and is currently one of the premier dancers at China's National Opera and Dance Drama Theatre.

The digital media was created by a team led by Kong Jiang, an experienced digital artist long established in China.

The creation of *Xihe Jianqi* was based on the study of sword dance in the Tang dynasty. Sword dance in the Tang dynasty was divided into solo dance and group dance. The solo dance was called '*Xihe* Swordwoman', and the soundtrack was a palace song of the same name. It was performed by a female performer with a sword as a prop. Movements imitated the splitting, stabbing, wiping, and picking of sword routines (Yu 2017). Based on solid classical dance training, Tang's movements present the aesthetics of sword dance, and an immersive digital environment that includes animations enhances the visual effects of this interactive dance. The digital interactive dance, *Xihe Jianqi*, involved large-scale, high-luminance projection equipment, which was projected on the surrounding performance environment and the dancer's body. It also used infrared-tracking equipment (Realsense and BlackTrax) and motion-capture equipment (Noitom and OpenPose) to capture the dancer. Using a depth camera, a large number of fluid animations were generated through capturing the dancer's movements. The animations of brushstrokes, calligraphy, mountains, Chang'an City and particles presented the interaction between the body and the fluid animations (Tian 2020).

Youyuan Jingmeng (游园惊梦) is a new-media theatrical dance performance created by Li Qing based on Tang Xianzu's 1598 literature classic, *The Peony Pavilion* (牡丹亭). Li is a senior lecturer at the Beijing Dance Academy, focusing on the study of screen dance and new media. In 2014, she completed *Youyuan Jingmeng* working with dancers Zhao Zhibo, Ma Jiaolong and a digital media team. This work is an exploration of how Chinese classical dance can work in relation to real-time interaction. 'The study of new media dance is a long process. During the process, whether it be an experimental technical creation or a new media dance performance, these practices will promote the development of new-media dance in China' (Li 2018: 35). Unlike *Xihe Jianqi*, which is a short work, *Youyuan Jingmeng* is a full-length new-media dance with narrativity.

Youyuan Jingmeng involved considerable innovation in terms of developing new hardware devices. 'Collaborating with a digital media team, I decided to use a self-developed infrared radar working with a high-speed camera to capture the positions of dancers. Movements were

converted into data. Through algorithms and data analysis, visual effects were generated in real time' (Li 2018: 34). Having an experienced digital technology team is important for the creation of interactive dance. During the performance, the unstable factors generated by technology often exert significant pressures on a choreographer. Li pointed out that sufficient preparation time is needed before a live performance of interactive dance works due to a considerable number of differences between the rehearsal and performance venues, including the sizes of the venues, the intensity of the lights, and the varying possible obstructions. It often took a long time to adjust the performance to the venue (2018).

Attraction (2012–2013) was my first interdisciplinary cooperation with digital artists from Britain and France, performing at the Beijing National Stadium as a national tourist show. It involves dance, opera, laser, installation, water screen, LED scenography and wearable sensor costumes. In this 60-minute show, my creation is the third scene *Gate of Power*. It is an interactive dance piece performed by 60 dancers whose faces are covered by masks. They wear golden garments, appearing as figures controlling human beings' lives under a magical scenography with LED screen, water curtain projection, laser and lighting. The golden garments are genderless and of extended size to hide the dancers' bodies. Bringing the choreography to life was a significant challenge. The usual detailed movement design would have been ineffective as spectators would not have been able to see anything from the distance, due to the considerable size of the costume. However, I found an effective way to utilise the size of the material so that the garments extended the dancers' bodies. In the movement design, I reduced the circle tracks of the movement, and used straight lines and direct up-down moves to present the body. The garments occupied big spaces, therefore in the final performance, when 60 dancers move together, it forms a satisfying visual effect. The function of the costume cooperates closely with the movement design and the dance performance and, as a result, it becomes one part of the overall scenography.

Projections were arranged in three areas, at the back of the stage, on the floor and on the water curtains on both sides. Every projection had a different function, for example, the back of the stage generated burnt money in lava, a huge dial on the floor, and lasers projected magical running dials on the side water curtains. All these projections and installations constructed an immersive environment for spectators and performers.

During the process of collaboration with artists from different disciplines, my interests were not only focused on dance making, but on how to utilise new technologies in choreography. In the beginning, I used the traditional choreography method to create the work, but the effects were very dull within a technological environment. Then I invited set, media and installation designers to my rehearsal, working with them together. This method changed my original cogitation on how to make dance. In this kind of large-scale digital performance, the choreographer's role was not only to develop modified movement, but also to use existing tools to boost the embodiment of dancing bodies. The garments, laser, installation, digital media and the hanging wire were parts of the choreography. In this environment, designing visual effects generated by the technological equipment was more important than designing movement vocabularies.

After two years working with the resident show, *Attraction*, the choreography of *Chasing the Dream* (2014) in the *Second Youth Olympic Games Opening Ceremony* provided another challenge for me to explore dance, working with materials and treadmills. This project involved approximately one year of brainstorming in Beijing and five months rehearsal in Nanjing, Jiangsu Province of China. It provided me with a further opportunity to work with digital media, installation and equipment after my first taste of dance and technology in 2012. Although I had experience in this area, the creation in digital environment situations varies every time. In this project, as an independent choreographer, I created one work named *Chasing the Dream,* including 500 dancers controlling 10 elastic materials, and another work named *Running,* where eight dancers performed on two large treadmills with LED garments, which lasted around 50 minutes. Zhu Hai, a producer for China Central Television, commented that *Chasing the Dream* presented a form of 'soft sculpture', which pointed out a new definition of aesthetic. There were two challenges in *Chasing the Dream:* one was how 500 dancers controlled these 10 elastic materials in a variety of ways, and the other was how the dance movements could still be clear under the large props, which could be viewed by spectators sitting far away in the stadium.

It was not easy to complete high intensity movements for 500 undergraduate dancers under a temperature around 30 degrees, while, in the meantime, coping with the huge props. Due to the number of performers, we had to rehearse on a football pitch. I, as the director, stood at a high level to give commands through a walkie talkie. One metaphor I used for the rehearsal was observing colour changing of pixels in graphic design. Imagining that there were 500

pixels, what can people see when 250 pixels changed the colour to red, but the rest of them remain blue. What can people see when pixels change colour from red to blue in the order from stage left to stage right? What will happen when two groups of pixels changing colours in different speeds? I found some very interesting images and symbols generated by 500 dancers when I used the metaphor of 'choreographing pixels'. Once the dancing bodies played with the materials in interactive ways, the props became necessary rather than superfluous. In addition, I saw the materials become extensions of the dancing bodies or pixels.

Running involved dancing on treadmills and wearing LED garments, and was my second experience working with technology. In this project, finding how to present dancing bodies on two installations with the wearable digital costumes presented a new challenge. Before the rehearsals, I went to the factory to test the machine and provided feedback to the engineers. I had to try a range of movements on the machine to see if it was possible or not and what kind of visual effects it could generate. Running was the basic movement, but I was aiming to complete a duet, lifting, posing and group lifting on the treadmill, which were more difficult. The feeling of standing on the machine was very different from standing on the floor, and when the machine was operating fast, the performance was more demanding.

During rehearsals, I worked with dancers on the ground first with codified movements. As choreographer, I needed to imagine the images on the treadmills, the speed of the machine as well as the running pictures when dancers were stationary. After gaining some satisfactory movements, we worked on the machine then adjusted the movement design according to the different feelings. One of the significant issues was that dancers could easily lose direction when they were moving on a running machine. Therefore, it was necessary to find the right way to change the momentum.

The LED garment was another issue, namely, how to make sure the electric circuit could work well over the time required and with the intense movements. In addition, significant amounts of sweat from the dancers affected the LED and the battery, and I had to ponder how to make this safe. I needed to consider and discuss all possible issues with the costume designer, and work on it in the rehearsal. In this kind of choreography, the movement design was no longer the most important, but rather, the question of how to present the 'smart

configuration' through dancing bodies took more time to work out. The choreographer had to change the movements according to the costume and vice versa.

This was my first time considering wearable technology in dance making, and this experience triggered my interest in wearable sensors which enrich the language of dancing bodies. The bodies spoke more complex 'words' than in traditional performance. The electric circuits were designed for various effects, so the dancers also controlled the smart costumes according to the choreography of the performance. One scene was with lighting off in the stadium, and spectators only saw the moving digital lights in the space, which could not be completed without the design of new technology. The digital figures ran very fast on the treadmill, and the floor projection generated a virtual environment to enhance the immersion.

2.3 Choreographic Systems

The concept of a 'choreographic system' is a theory defined by Birringer, which considers two generations of interactive design, direct/indirect interface construction and kinesthetic atmosphere in dance composition. Birringer proposes that

> Techno-choreographic working methods incorporate instruments (cameras, data projectors, microphones, sensors, microcontrollers) and software tools allowing them to structure and control the various components of a performance event: sound, video, 3D animation, motion graphics, biofeedback, light. It is the convergence of choreography with instrument and system design – the languages of programming, electronic music and film editing in real-time processing – that I define here as 'choreographic system'. (2018: 470-471)

Live performance is created in a dynamic process and there is no hierarchy between the dancing bodies and the instruments, such as camera, sonic equipment, material, computer or sensor. The tools of digital performance are significant, and choreographers and dancers need to understand the process of dance making, how bodies interact with these tools and how the digital impacts on the framing of movement. Nicolás Salazar Sutil and Sita Popat in their research address the notion that 'human movement is transformed by developing techniques and evolving technological tools that expand and refine our motile capabilities, and thus help us to understand ourselves through cultures of movement' (2015: 1). It is true that movements in the physical space and projecting on the screen provide varied visual effects, and this kind

of presence helps dance workers to understand the potential of movements. In my research, working with the software tool Isadora helps me understand the potential of Chinese dance vocabulary such as *suibu* (brisk steps) and *pao yuanchang* (circling the stage). I apply this method to develop Chinese dance, a process described in more detail in chapters three and five. Similar to Birringer, Sutil and Popat, I will argue the impact of technology on human movement and give examples of how dancing capacities can also be expanded by tools, yet I also pay close attention to the shaping influence of dance knowledge on the tools.

This idea of a 'choreographic system' supports dance makers in constructing and perceiving an immersive environment where an intimate dialogue takes place between performers, participants and spectators. Innovative programming can involve a Kinect camera in an interactive installation performance, for example; spectators can move in front of the camera to interact live in real time. Birringer argues that choreography 'has undergone a re-evaluation in terms of how bodily movement produces data or how a performer or "immersant" engages with an interface environment that is programmable and networked, and thus open to unpredictable and emergent states. These states evolve from the system behaviour as a whole, from the digital body-environment interaction' (Birringer 2008a: 118). The digital body-environment interaction provides possibilities to understand trained dancing bodies in physical and virtual spaces. In my understanding, the dancing bodies do not have to exist in a digital performance after a programme has been generated through the capture of dancers' movements. An interface and programmed machines can exist in a digital performance without dancing bodies.

Birringer has narrowed interactivity to two phenomena: 'interaction' as a spatial and architectural concept for performance, and 'interactivity', which he describes as,

> In the narrower sense of collaborative performance with a control system in which the performer's movement, gesture, and action are tracked by cameras/sensors and thus used as input to activate or control other component properties from media such as video, audio, MIDI, text, graphics, QuickTime movies, scanned images and so forth. (2003: 89–90)

He has compared these phenomena with Dixon's definition of interactivity in artworks and performances in four distinct categories of 'Navigation, Participation, Conversation, and Collaboration' (Dixon 2007: 20). The research on interactivity by Birringer and Dixon is

inspiring to choreographers who design interactive environments. For example, during the experimentation concerning this practice-based research, I asked myself which kind of works I intended to create exploring the embodiment of Chineseness. Would it be a digital performance in which spectators are observing the work from the outside, or a navigated installation involving Chinese culture that spectators can wander through by themselves? Bringing the concepts of 'interaction' and 'interactivity' to this study, I have experimented with cultural objects (chopsticks and red silks), worked with microphones, software, projections and virtual reality in studios and theatres, as well as outdoor environments such as trees, rivers, parks and historic venues.

In the theory of choreographic systems, Birringer defines two generations of interactive design which are significant notions in the realm of dance technology.

> In the *first generation* of interactive dance theatre of the 1990s, when 'mapping' (gesture to sound, gesture to video output) was explored in the interface configuration for performer and reactive environment, such understanding of the system was inspired by the cybernetic vision of feedback control and the modelling of the machine on the human actor. Direct interfaces (flex sensors, accelerometers, micro switches, pressure plates, and so on) required specific techniques of use which sometimes led choreographers to argue that the dancer acted as a live video editor or musical instrument. (Birringer 2018: 471)[20]

'Mapping' is an important concept in the first generation of interactive work. Dancers' movements trigger sounds and video images and this kind of interaction is user friendly for dance practitioners to explore both in higher education and in dance companies. Since the interactive effects are visible, dancers learn how to generate movements in this kind of environment and play with the effects triggered by their movements. However, if they want to explore further, they may need to spend time to train their bodies into becoming more sensitive to inhabiting digital environments. Coniglio has stated that dancers gain capability 'through long hours spent practising with an instrument – their body – that is incredibly high-resolution and responds very dependably to the commands sent to it by their brain' (2015: 278). This instrument plays a key role in mapping.

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[20] Birringer first defined two generations of interactivity in his monograph *Performance, Technology & Science* (2008). More details can be found in the chapter of 'The Interactive Paradigm' in this book.

In my research, I found that the first generation of interactivity defined by Birringer is sympathetic for choreographers who do not have much knowledge of software and dance students who might have less choreographic experience in higher education. This kind of interactivity can be explored under limited circumstances. The only necessary equipment is a computer and a web-camera. The camera captures movements and the data operates through software such as Isadora or Max/MSP/Jitter, so that graphics and sounds are triggered by movements. But there is one rigorous demand on this system. As Coniglio has asserted, 'your systems must be *extremely* sensitive to human gesture; they must provide a rich variation in the output that is directly tied to variations at the input, and they must ensure that the output for a given input should be both reliable and repeatable' (2015: 283).

Compared to first generation interactivity, second generation interactivity explores further the performing atmosphere.

> *Second-generation* interactivity heightens the experience of human embodiment as the sensory coupling of dancer and virtual environment evolves in noncausal (non-triggering) correlation with one another. Ideally, both performer and performance system respond to the other's enactment by undergoing self-permutations on the basis of distinct operational rules (a form of "post-choreography") which are internal to them. Moving towards indirect interfaces (optical, magnetic, and ultrasonic sensors or machine vision), however, creators of such performance systems often prioritize the development of software techniques over physical techniques. (Birringer 2018: 474)

Second generation interactivity involves deeper concepts of kinetic environment. Participating in this type of dynamic and immersive environment involves multi-layered connections being created between performers, participants, installations, props, sounds and digital images. For dancers, 'they can *feel* the audience as they perform, and will respond in situ, imposing subtle changes in timing and dynamics that intensify the viewer's experience' (Coniglio 2015: 278). The viewers also contribute to the shared environment, perceiving the enacted atmosphere and transforming it in between indirect interfaces. This form of second generation interactivity is difficult to repeat. As Birringer demonstrates further:

> In such environmental practice there can be no set piece (choreographic), nor can one speak of improvisation, since the interactive potentials are shaped by particular aesthetic and mathematical principles requiring that performers adopt

specific physical techniques to play the instruments of the medium and learn new proprioceptive and sensory processes. (2008a: 119)

The circuit of continuous perceiving, changing, sending and adapting is a feature of second generation interactivity. Learning and constructing the computational processes are challenging for choreographers and performers. The creative practitioners involved in second generation interactivity must possess digital knowledge to be able to act immediately, and might also need a philosophical understanding of the environments where they are situated. As Birringer proposes:

> Interactivity points to a new understanding of environments of relations and a relational aesthetics based on interhuman exchange or physical interaction as well as a new technological kinaesthetics. Designing digital interfaces thus means organizing a sensory and intelligent space for communicative acts that are inherently changeable and unpredictable. The space is not "set" for a fixed task, but programmed for potential interactions in which partners behave within a network of relays and responses, and in which media generate perceptions of reality. Interaction thus involves the whole environment. Partnering maps the "world" through the continuous biofeedback it receives via direct sensory stimuli, which are also technically mediated. (2008b: 188-189)

2.4 Immersion

Immersion is a generous concept in different disciplines. In Josephine Machon's study in immersive theatres, she claims:

> to 'immerse' is 'to dip or submerge in a liquid', whereas to 'immerse oneself' or 'be immersed', means to involve oneself deeply in a particular activity or interest. 'Immersion' thus defines the action of immersing or the state of being immersed; whereas 'immersive', developed from computing terminology, describes that which 'provides information or stimulation for a number of senses, not only sight and sound'. (Machon 2013: 21)

Based on Machon's statement, the combination of dance and digital media can provide an immersive environment for dancers to move during perceiving; for participants to forget themselves and dip into the atmosphere. Using VR equipment to immerse a dancing body has become a trend in the technological era. But, performance in VR still has certain limitations. For such a computationally simulated immersive environment, spectators have to wear glasses

and headsets so that they can experience a 360-degree environment. Audiences, viewers and users participate in a three-dimensional environment created by computer software, and 'this entails the use of sensors and devices to register input from the user/audience member to be integrated with the computer generated 3-D environment' (deLahunta 2002b: 105). There are currently two types of VR, one in which people can experience a 3D environment via wearing 3D glasses, and another in which participants can control and trigger animations via controllers, such as HTC VIVE Pro Eye. DeLahunta has addressed the principle of VR and performance, and noted that during the development of VR technology, getting it working in the performing arts has required dealing with limiting issues. For instance, people who wear the headsets for a long time might feel dizzy. Although the headset was developed to accommodate wireless technology, it is still quite heavy. Another issue is that viewers cannot share what they are experiencing with others. Finally, there is a tactile issue. Normally people cannot touch the 'environment' they see through headsets, although the creator might arrange some installation to construct the environment, but intimacy needs to be further considered. In recent years, immersive dance and working with VR have made considerable progress. For example, the creative works including multi-user installation and the 360-degree VR music video created by Das Totale Tanz Theater in 2019.[21]

Fig. 8. HTC VIVE Pro Eye kit. © HTC Company.

The theory of choreographic systems also considers continuously changing environments through the lens of immersion. DAP-Lab's current research focuses on augmented reality and

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[21] Das Totale Tanz Theater was a program aspect for the 100 years of Bauhaus Anniversary and a collaboration between the Interactive Media Foundation and the internationally acclaimed choreographer Richard Siegal and Artificial Rome. https://www.dastotaletanztheater.com/.

immersive environments that include virtual reality.[22] The first several dance installations created by Birringer and the DAP-Lab were titled *metakimospheres* (2014–2017), as they were developed during a European cooperative research project, METABODY (http://metabody.eu). Punning on the common understanding of the metacritical level of work that reflects on its own making, Birringer tried to shift attention to the Greek preposition *meta-* (μετά) in its multiple other meanings such as after, beyond, beside, among, through (Birringer 2017). Kimospheres are 'kinetic atmospheres or environments staged for visitors that pass through them, listen to them and feel them, unconsciously, attentively, distractedly, blindly' (Birringer 2017: 27). Metakimospheres invite spectators to participate, sense, touch and explore physically and virtually (through VR glasses) what is perceivable in the shifting and unstable environments. The kinetic atmosphere is constructed by materials, objects, projections, technological equipment, performers, engineers and spectators, who experience and perceive this shared atmosphere. There is a small difference between kimospheres and metakimospheres, in common understanding: kimospheres focus on dynamic and interactive environments which are constructed by participants inside installations. In comparison, metakimospheres are more than just environments, but also situated in the layers of philosophical reflections concerning objects, movements, the internal and external energies of bodies, and the elemental presence of a kinetic atmosphere between or beyond them.

The notion of metakimospheres is valuable in considering choreography and technology. Drawing on theories from Birringer, I contribute to metakimospheres from the perspectives of a choreographer, dancer, and a research practitioner, composing and participating in this kinetic atmosphere, providing a reflection from my experiments. Especially, how to use metakimospheres as a methodology in dance composition. The entanglement of sonic chopsticks with dancing bodies in a kimosphere provides a transcultural understanding in the context of digital performance. Dance scholars Sarah Whatley and Hetty Blades (2019) demonstrate that dancing bodies are an open system in digital environments; the flesh bodies receive input and explore tactile spaces in physical and virtual spaces. The dancing bodies I explore in this research are agents who receive echoes from the sounds generated by chopsticks through software (interactive system) and connect to projectors in a shared atmosphere to evoke modes of 'digital dance' which reveal the intervention of choreography through computer and graphics. Digital media output, when software patches effect and

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[22] DAP-Lab is a cross-media lab founded by Johannes Birringer and Michèle Danjoux in 2004. For more details, please visit the website of DAP-Lab: http://people.brunel.ac.uk/dap/.

modulate inputs, changes the expression of dance or of the movement perceived inside the environment. Projections that move can also affect the space itself, of course. Computer science scholar Lev Manovich states that, 'We are in the middle of a new media revolution – the shift of all culture to computer-mediated forms of production, distribution, and communication' (2001: 19). Therefore, choreographing dancing bodies with computer-based technology as part of my experimentation highlights the animation of Chinese dancing bodies in the digital era; specifically it is the objects I use in the choreography that allow for sound and image manipulation.

Birringer also addresses the issue of intimacy in immersive environments, and as a digital choreographer he has created a series of installations titled *kimospheres*. Birringer suggests that 'Dance installations as I had understood them over past decades were largely site-specific or geared towards an experience of sensorial or somatic tendencies: dance as physically interactive constellation requiring engagement, deep listening, touch, playful or ritual responses, attention, care, un-inhibition' (2019: 98). In the following section, I examine choreography and technology through three works: *kimosphere no. 5* by DAP-Lab, *+/- Human* by Studio Wayne McGregor, and *Whist* by AΦE. The reason for choosing these three works for analysis is because of the immersive experiences I have had with them as both a spectator and a dancer.

2.5 *kimosphere no. 5* by DAP-Lab

DAP-Lab's productions focus on design, wearable intelligence, performance and new technologies. I was lucky enough to join DAP-Lab in 2017 as a dancer, working with talented artists in this area.

kimosphere no. 5 is part of a continuing series of 'kinetic atmospheres' and was performed at the theatre of Queen Mary University on 9 December 2017. Birringer states that

> Kinetic immersion includes motion of light, pixels and graphic projection, diffusion of sound waves, energy fields, color fields, implausible edge-spaces and anomalies, fantastical creatures and the homuncular that can be touched, handled, prodded and dragged, thus many different forms of embedded motion sensing which result in environmental reactions. (2019: 109)

kimosphere no. 5 included dance, aspects of the Korean *kut* ritual (performed by Haein Song), wearable technology, installation, sensors, electronic sound and VR, which constructed an intimate immersive space. Dancers moved in various areas in the theatre installation, and spectators had opportunities to interact with dancers or just watch them from the side. A variety of scenes occurred in this atmosphere. There were connections between every scene, and spectators explored and imagined them according to their own experiences. Birringer has named these kind of atmospheric installations *kimospheres* since they compose a particularly dense sensorial field (using suspended fabrics, paper, wood, light and color projection, and organic objects in space, alongside the digital elements) that produces the tendencies of 'how bodies and matter come to affect, and be affected by, augmented reality and virtual reality interfaces within kinetic atmospheres' (2019: 96).

During the performance, I, as a dancer, strongly felt that the audience also becomes part of the performance. They walk into my performance environment and I watch them, my dancing body flowing in the space. I watch the audience while moving, the motivation of my movements comes from them and what I can feel through their eyes, smiles and poses as they watch me. The information from them becomes part of a story which I narrate through my dancing body and manipulation of the materiality of my plastic costume designed by Michèle Danjoux. Birringer suggests that such dancing in 'a physically interactive constellation requires engagement, deep listening, touch, playful or ritual responses, attention, care, un-inhibition' (2019: 98).

Doros Polydorou created a 360 degree digital world of a forest in this project. Audiences wore the VIVE headset and entered an immersive forest. They were invited to stand on the dried leaves with bare feet, so that the immersion also happened physically. Birringer describes this in the following way:

> They cannot see their own extensions (say, their hands or feet) in the layered environment, but they can feel them or compensate (when they touch a branch, the sand, or leaves on the floor) by trying to balance their bodies "floating" in destabilized architectures. They reach, as they feel urged to touch the tamarind trees or the grass. Some of the visitors, perhaps unaccustomed to VR, choose to sit or lie down, yet move their bodies around, turn, twist. (2019: 105)

In this interactive environment, virtual reality and objects brought feelings to audiences, providing a way of viewing and creating the immersion:

> With our dancers as part of the Kimosphere, sometimes acting as guides, the audiences become the performers invited to step inside the physical landscape and touch, listen, move around and at some point put on the HMD to enter into the virtual environment.… Audiences inside VR also touch and are touched by dancers outside of VR. (Birringer 2019: 105)

The relationship between dancers and audiences created with digital technology, and the experience of the atmosphere were non-repeatable. People needed to experience it, feel it, and create it themselves. I argue that these non-repeatable immersive experiences contribute to the participants' understanding of the specific culture involved in a *kimosphere*. During the course of her own research, the digital artist Haein Song created an *Ecstatic Space* based on what she refers to as *Mugu* or 'Shamanic User Interface', and she performed a version of this traditional Korean cultural practice in *kimosphere no. 5*, using large suspended *kime* floats (paper cut into patterns). Participants were immersed in this dynamic atmosphere to understand *kut*, 'an indigenous shamanic performance ritual that employs a set of shamanic, artistic and nature-centred techniques' (Song 2019: 21). Participants can therefore understand the religion of *kut* through the tactile immersive environment.

2.6 *Whist* by AΦE

I went to experience *Whist*, a surreal dance combined with VR directed by Esteban Fourmi and Aoi Nakamura at Lilian Baylis Studio at London's Sadler's Wells on 20 June 2018. There were six differently shaped objects arranged in various positions, and also some stickers on the floor that looked like the entrance of caves. These stickers and objects on the floor were the trigger of the virtual reality world. Visitors had to find the objects in the real space according to what they saw in the virtual world, and then the next scene was triggered. There were more than 200 different journey routes, based on the order of finding the objects.

After receiving the glasses and headsets, people were separated into two groups, which helped visitors to have enough space for their journeys. I have experienced VR glasses many times, but this VR set was wireless equipment so I felt more comfortable. The introduction clearly told me how to adjust volume and focal length. Then, a small red ball appeared at the centre,

and I needed to aim through it moving my head. I triggered the first scene when I found the object in the real space according to the image that appeared in the VR.

I was situated in a cabin, and I could see the whole environment through 360-degree vision. I heard footsteps behind me, and the door opened when I looked back. A man walked to the sofa, and a thrilling story took place in a duet. It was a narrative scene, and participants needed to find the connections between different virtual environments. The users had to take off their glasses to find the next aiming object, because when wearing the glasses one could not see the real environment. It was a subtle feeling, being situated in a virtual environment, but occasionally you could touch real objects. Visitors could sit or lie down on the floor in order to hear the sounds from one corner. In a quartet scene, every character was eating organs covered in blood at a table. Once you looked at him or her, the character interacted with you. This design was very impressive, and it was definitely a significant development of VR (Fig. 9).

After around 30-minutes, you gained a number at the end. The staff had given me a card so I could write down my unique journey number, along with what I had experienced during the play, and the implications. The interactive design in this work was to find the same objects in virtual and real spaces and the scene could be triggered only when you aimed at two images correctly including the alignment of the angle and the distance.

Fig. 9. Visiting *Whist* at Sadler's Wells, 2018. Photo: courtesy of *Whist* staff.

The issues also appeared clearly. The six objects in the real space were used to trigger the scenes, but visitors did not need to touch them. In addition, these objects did not exist in relationships with the virtual environment. The issue of tactility continues to be a problem in virtual performance. In *kimosphere no. 5*, Birringer tried to enhance visitors' perception, deploying leaves on the floor and suspended *kime* to intimate a real forest. The combination of physical sensation and virtual environment needs to improve for the work of *Whist*.

2.7 +/- *Human* by Studio Wayne McGregor

Wayne McGregor, a British choreographer, has been exploring choreography and technology for years. 'McGregor began investigating the possibilities of digital media as tools for dance-making in the 1990s by working with scientists to build an artificially intelligent computer-

based "entity" to be present in the studio alongside the dancers' (Leach and deLahunta 2017: 461). He has utilised virtual reality, drones, digital technology and installations in his creations. *The Choreographic Language Agent* is a research project, undertaken in cooperation with deLahunta, exploring an improvisational tool that supports the choreographic process.

On 26 August 2017, McGregor presented his work *+/- Human,* which was a dialogue between dancers and drones at The Roundhouse, London. Audiences were seated in a circle and there was no front or back of the stage. At the beginning of the show, I heard the sounds of the drones first, then saw seven white globes flying into the arena. Dancers ran into the arena in one line, observing the world co-existing with these technological objects. A dialogue between human beings and drones occurred. I felt the relationships between them as the drones moved according to the dancers' movements. The sensors on the seven white globes detected the dancers' behaviours.

One of the scenes consisted of the aircraft being concentrated intensely on the centre of the stage due to the fact that the dancers were gathered together. The sensors attached to the drones watched how the dancers moved and where they moved. The drones were slowly dropping down, so that the spaces for the dancers were narrowed. They had to lie down on the floor. This scene touched me quite strongly. I felt the threat from machines, and how technological development is affecting human beings. For example, drone use has developed rapidly in China in recent years, and companies such as Jingdong and Alibaba have started to use drones to deliver goods. Machines work fast and without breaks. The development of drones has undoubtedly saved manpower and they work efficiently, but it has also increased the rate of unemployment. Those couriers who are engaged in unskilled jobs might be replaced by machines. Returning to McGregor's work, I felt the pressures being experienced by these dancers as they tried to find ways to escape the observation of these machines.

The 'sky eyes' on the globes follow the dancers at all times. Throughout the show there is the sensation of being watched. The arena evolves into a giant petri dish and it is not hard to imagine alien homunculi inside the spheres studying the specimens below' (Norman 2017: 16). I strongly felt the interactivity between dancers and aircrafts. Neil Norman comments that

Occasionally, they hover in formation before splitting like atoms to take individual paths around the ceiling. Some dancers seem unaware of their presence. Others, such as the Royal Ballet's Edward Watson, watch them at all times as if trying to work out who is controlling whom. (2017: 16)

Playing and escaping happened in this scene. Dancers moving in groups, solos and duets were the activators of the drones. I enjoyed the interactivity. It could not be completed without these aircraft, which expanded the visual possibilities and performing spaces. In this work, there was potential to develop, but 'the combination of slippery conceptualism and powerful dancing makes for an engaging, lightly immersive experience' (Norman 2017: 16).

Involving drones in this performance helped to develop the visual spaces. McGregor's dance composition was no longer limited to the dancing bodies, but could explore how dancing bodies were intertwined with the installation in this work. The dancers did not have any direct contact with the drones, but 'indirect interfaces' (Birringer 2018: 474) were constructed. According to Birringer, 'In an indirect interface, the performers (or participants) are challenged to re-organize their motional, affective, perceptive, and proprioceptive behavior in the environment' (2018: 474). In +/- *Human*, pre-choreographed movements and the environment needed to adjust immediately when the heights and the positions of the drones changed in the live performance. The machine is not reliable, and unpredicted situations could happen in such digital installation performances.
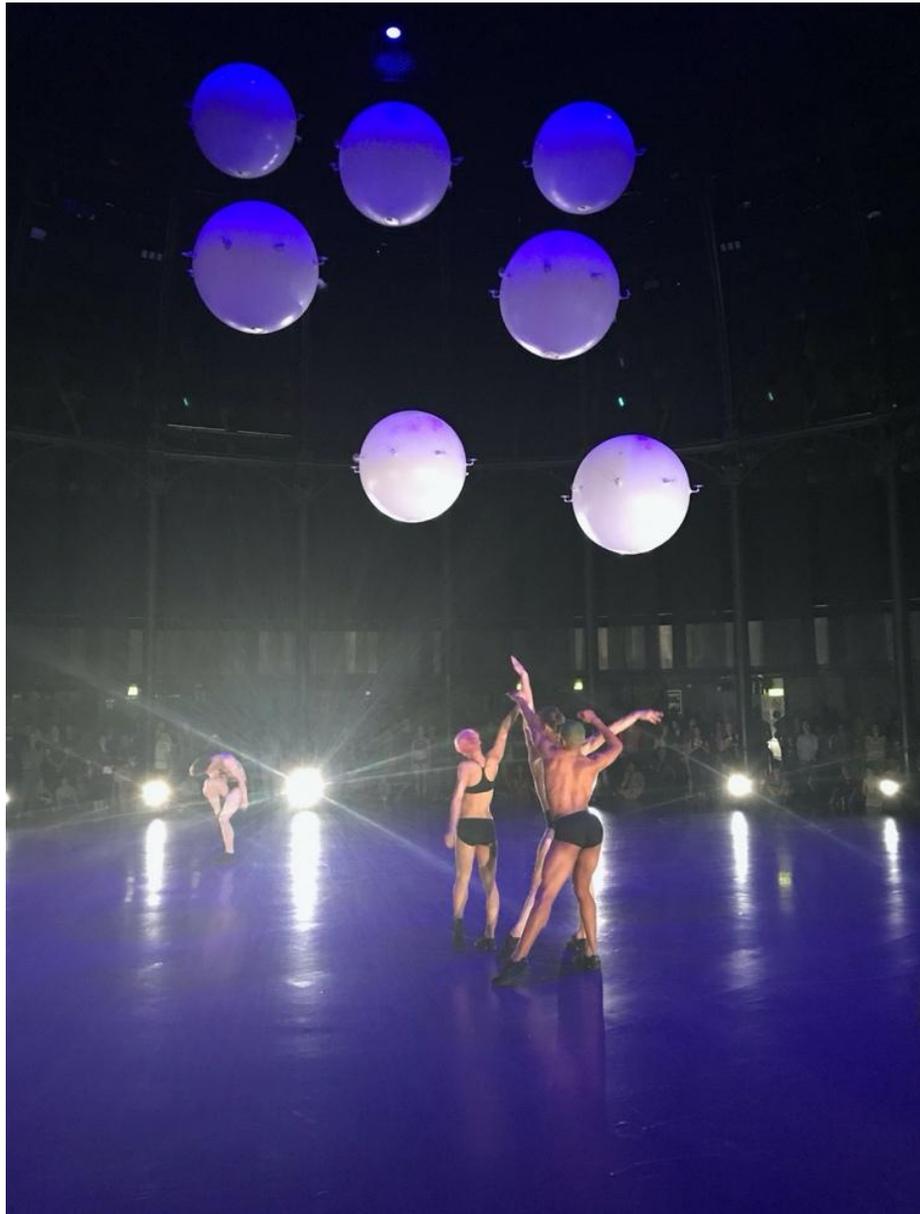
Fig. 10. +/- *Human* by Wayne McGregor, 2017. Photo: Zhi Xu.

2.8 Techno-Choreography

Techno-choreography is a methodology that considers professionally trained dancing bodies and cultural objects as key factors of technology-driven dance compositions. Techno-choreography contributes to the generation of dancers' movements and the creation of new potentialities concerning digital performance. Based on the theories of choreographic systems and immersion, techno-choreography involves software tools, web cameras, Kinect cameras, sensors, and VR headsets. It also involves live synergistic designs interacting with professionally trained dancing bodies and cultural objects that include chopsticks, *gaoqiao*,

fans, handkerchiefs and red silks. My intention is to use techno-choreography to explore the embodiment of Chineseness in digital environments.
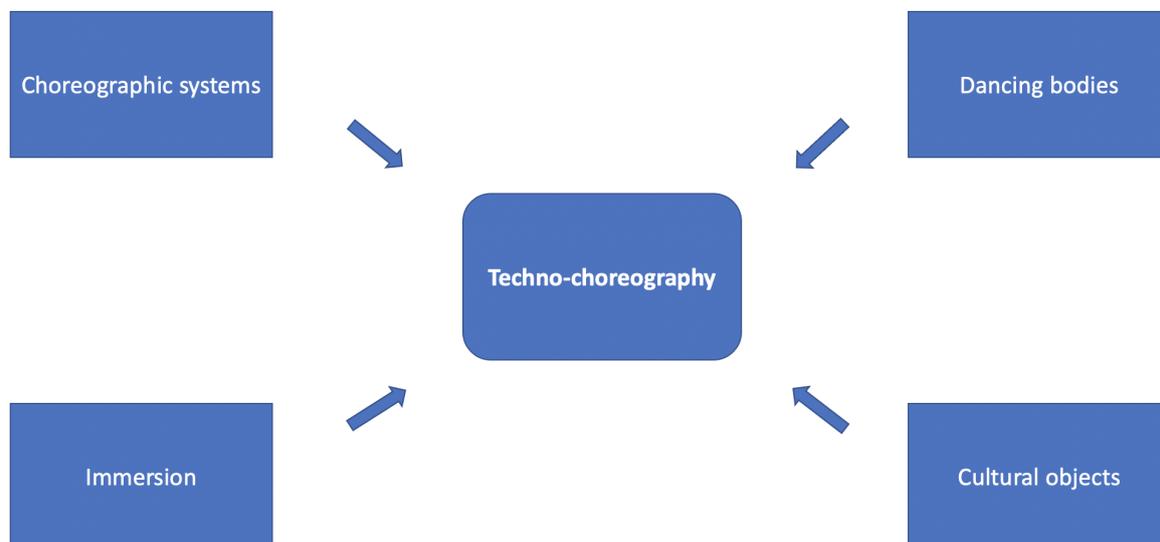
Fig. 11. Diagram of techno-choreography by Zhi Xu. © Photo: Zhi Xu.

My investigation found that most research focuses on the relationship between bodies and interfaces, but not on how culturally trained dancing bodies generate different kinds of 'data' through sensors and software tools. I consider professionally trained dancing bodies with Chinese dance in digital technology from the perspective of techno-choreography. Cultural identity in dance studies is a vital subject. The concerns for dancing bodies in digital environments in China are only a small part as yet, compared to the studies in Europe and the US. A problematic issue is that technology is utilised in Chinese dance circles primarily in commercial shows including large-scale site-specific performances and digital lighting shows combined with fountains in cities. Theoretical and practical research of dance technology that focuses on identity and methodology is rare.

My research investigations did not consider large-scale performances, or expensive technological equipment such as holographic technology, but methodology and research outcomes that can teach students and help them to develop further under the conditions they are equipped with in higher education, and thus to also develop their own artistic and cultural sensitivities. I argue that cultural dancing bodies, (inter)cultural identity and cultural objects are vital in techno-choreography, as body memories and cultural objects—becoming digital instruments, so to speak, affecting new technologies—contribute to the processes of

choreography. The intercultural movement knowledge, at the same time, contributes to the technical design and accoutrements as everything become inextricably entangled. In subsequent chapters, I analyse dancing bodies and cultural objects in techno-choreography through *X-Body* (2018), *Mourning for a dead moon* (2019), and *Unexpected Bodies* (2020), all of which are directed, performed and programmed by myself.

Chapter 3. *X-Body*

X-Body (2018) is a 50-minute work exploring dancing bodies trained in Chinese dance and choreographed in and through a digital environment. I have examined Chinese dance in Chapter 1 from the point of view of its various categories and aesthetic principles. In observing how dancers interact with software tool under a live interactive design and a digital environment, I now probe various enactments of kinesthetic forms, principles and expressions with regard to Chinese characteristics that can be gleaned from the responsiveness and behaviour of the performers, the impulsiveness of interactivity, the choreographic aesthetics of dancing bodies, and also the generative, reverberating side, such as the motion graphics and dancing images generated by them.

In this creation, I was the researcher, choreographer, dancer and the programmer of patches in two software environments, Max/MSP/Jitter and Isadora. My training background and eight years of working experience collaborating with interdisciplinary artists gifted me the opportunity to investigate dance technology from the perspective of cultural identity – specifically Chineseness. In the 21st century, the field of dance technology has become significantly more advantageous to dance practitioners due to the development of software that includes Isadora, Max/MSP and Resolume, all of which built on the pioneering capacities of MidiDancer, BigEye and EyeCon. Practitioners can enter ideas directly into programmes due to this user-friendly software after a series of training. Also, choreographers can test ideas that not only focus on the traditional manners of codifying movement, but those triggered by technological interfaces during the process of dance-making.

To explore how dancing bodies trained in Chinese dance forms interact with and impact computer-based digital technology, *X-Body* unfolds in an unstable digital environment consisting of sensors, objects, projections, sonic effects, software and microphones. The choreography consists of three periods: test, rehearsal and synthesis. The first period was completed with production support by DAP-Lab members (Johannes Birringer and Dee Egan) at the Artaud Performance Centre, Brunel University London, from March to the beginning of May 2018. The idea of 'hanging microphones' appeared at this time, and I tried to interact with various hanging/suspended objects through improvisation. Egan principally used Max/MSP to record the live environment, songs and the impact sounds of my body contacting

the floor and installation. The rehearsal period was completed with four professional dancers from the University of Roehampton, Dance Department in May 2018, and a rehearsal show took place at the Artaud black box theatre on 6th June 2018. Ideas appeared during the test period and changed when the number of dancers increased from one to four, so I had to adjust my thoughts according to the new situation. Fortunately, I found new and creatively fulfilling means by which to explore dancing bodies in interactive digital environments. The final period of synthesis occurred between 19-25 September. *X-Body* premiered at the Artaud Theatre on 26th September 2018, performed by Miziying Wang, Jiajie Zhou, Rumeng Li, Limeihui Zhu, Zhi Xu with live musician Dee Egan.

X-Body includes five scenes: *Yuan* (Origin), *Tan* (Taste), *Qi* (Breath), *Chan* (Twist) and *Dong* (Move). *Yuan* (Origin) is a group dance focussing on how dancing bodies who are culturally marked as Chinese or Chinese dancing bodies inhabit digital environments created by the Isadora software. The digital environment is constructed through two projections, and these elements form multiple spaces that dancers inhabit. *Yuan* forms a dialogue between a solo and quartets, positive and negative energies, past and present, the virtual and the real. Dancers construct these relationships while the installation and digital media connect to each other but are also able to exist in separate spaces.

3.1 Observing the Dancing Body through Max/MSP/Jitter

Tan (Taste) is a solo work performed by Jiajie Zhou and focusses on an exploration involving a live camera (Fig. 12). The movements of the dancer are captured by the camera and sent to Max/MSP/Jitter, processed into projecting a virtual dancer. In the software patch, I can change the shape, speed and size of the virtual dancer to explore the possibilities that emerge between the real and the virtual dancers. As noted by artists who work with the same software interface, 'All decision-making, navigation of the MSP environment and qualities of expressivity are selected, initiated and manipulated live by the performer' (Wilson-Bokowiec and Bokowiec 2006: 49). Just as Julie Wilson-Bokowiec and Mark Alexander Bokowiec's statement suggests, our dancer, Zhou, is controlling the virtual partner. While this is true, the parameters of Jitter are another key factor in this digital environment. I made three different patches to provide interactivities between software and dancer, the real dancer and the virtual partner, and the data and physical power. Zhou's movements, interestingly, trigger the digital

figure, and the digital partner also provokes Zhou's movements. As scholars Sarah Fdili Alaoui, Cyrille Henry and Christian Jacquemin argue, '… the digital era has opened new and responsive possibilities, which are anchored in collaborative entanglements between performing arts, design and engineering' (2014: 159). This 'duet' is impossible in a traditional performance, and the visual effects are standing on the crossroads of traditional and new technological forms of performance. In Susan Kozel's research, she comments on the relationship between real and virtual figures: 'The same is true of the motion captured figure: it exists, it is not exactly the same as me, but it is also not irrevocably different from me, and, in a broader sense, we cannot pretend that the digitization of our bodies and social relations is going to evaporate or even diminish. Like it or not, we have digital twins' (2007: 250).

Tan (Taste) examines a dancer's experiences in relation to a web-camera and projection material which form '… the interaction between a motion-captured dancer and a digital performance agent' (Karreman 2018: 492). In Laura Karreman's research on motion capture and dance, she points out that,

> Artists and researchers who are enthusiastically engaging in this challenge are often not really driven by a perceived necessity of computing dance to improve existing dance transmission; rather, they are curious as to what technology can do. Their investigations are directed by how technology opens up new ways of experiencing and understanding dance. In a larger perspective, such projects can be understood as part of the current striving to rethink what it means to be human and connect to others in a time characterized increasingly by technologically embedded selves. (ibid)

During our rehearsal process, Zhou regularly ignored the occurrence of the digital figure on the projection screen. She did not notice the transitions of the digital figure that she was generating, and did not realise the real-time interactions in the space. I asked her to slow down after a short movement sequence, so that the visual effects generated by her movements through Jitter had time to 'complete'. Zhou argued that she needed more time to complete her movements as she had just started to present her dancing body. I understood her opinion. As a professional dancer, Zhou needed time to show her skilled dancing body and the techniques she had trained with for years. However, in an interactive dance performance, dancing bodies do not dominate the space but are part of the performance environment as a whole. As the choreographer of this work, I did not look at Zhou's movements all the time, and was equally

curious about what happened with the projected movements, which were also caused by Zhou. In Birringer's research, he claims:

> a camera vision system captures the performer's silhouette in real-time and immerses the performer in a virtual space where [João Costa] interacts with thousands of small particles. The particle behavior and composition is modelled in real-time by the generative nature of the system, responding to the interpreter's motion. This collaboration initiates a real-virtual dialogue embodied in the projection space or, rather, embodied in a recursive correlation between self-moving performer and augmented environment. The performer can learn to interpret how every perceptual experience (even of abstract particles or shapes) refers back toward an action of the body on itself, and thus toward the dynamics of proprioceptive space. The image projection enables the visualization of this relation that results in a motion graphics composition representing image-movements of a body – not the body representation of the interpreter but the merged "body" that is the outcome of the performer's expression and the system behavior. (Birringer 2008b: 149)

Zhou interacts with the abstract figure she generates, and 'the interactive space domain becomes hybrid and probabilistic, not only implying a switching between figurative and abstract imagery, but also a reorientation from a predominantly visual sensory interface to a bodily or affective interface' (Birringer 2008: 149). This was the first time Zhou had worked with live interactive technology in dance production. At the time of our tests, she was completely immersed in her movements and expected the completion of her movements to have priority in the design.

I explained to Zhou how important it was to leave enough time for the visual effects to become active, and I showed her the recording of the rehearsal. She then realised the difference between dancing with the digital and dancing without technological intervention. There is no need to rush to show dance techniques, but there is a need to extend care and engage with the occurrence of the avatar. In Zhou's interactive solo, I intended to build up the layers of the dialogue between the dancing body and the avatar. This design was no longer reflected in the technology itself, or the dancing body itself, but became an entangled 'duet' in a dynamic and relational atmosphere.

Fig. 12. The dancer, Jiajie Zhou, interacts with a live camera through Max/MSP/Jitter in Tan (2018). Video still: Johannes Birringer.

3.2 *Qi* (Breath) – Mediating Dancing Bodies with Sonic Chopsticks

Chopsticks are cultural symbols of considerable complexity as they resonate in cuisine and food culture (as eating utensils), family culture and traditions, ethics, religion, and customs that have various folk narratives associated with their use. Made of different materials such as wood, bamboo, silver, gold, or copper, the chopsticks can also express artistic and aesthetic sensibilities of Chinese people. In this part of my research, I explore chopsticks connecting to sonic equipment and processing through the software application Max/MSP. I question the choreographic method of performing with chopsticks and the embodiment of this culturally specific identity of Chineseness in a shared atmosphere mediated by digital technology. I am eager to delve further into this interdisciplinary field as a practice researcher, to contribute to Birringer's theory of choreographic systems, which I examined in the previous chapter, considering however a very particular viewpoint of cultural knowledge for my methods of dance composition. Chopsticks as an interface in this research connect to dancing bodies and computers through sonic equipment and software. Chopsticks are thus also a component of my technology. Drawing on Birringer's theory, I sense the emotion and the cultural symbol of chopsticks, as they evoke in my own body memories, habits, smells, interior landscapes. As a

choreographer, I find ordinary objects have the potential to trigger dancers' intrinsic impulses, and the atmosphere created by a choreographer could be purposeful as well as playful in the interactive scenario.

Before examining sonic chopsticks in the performance, I introduce the historical Chinese Mongolian chopstick dance and my body memories from this dance form. This form focuses on dancers' enthusiastic expression through footsteps and tapping their bodies with chopsticks. It is a significant dance module in dance education in China. My first exposure to the chopstick dance was studying at a conservatoire where dance students had to learn this dance form along with Chinese classical dance, ballet and dance technique. Due to the cheerful rhythms and the attractive props, I enjoyed it during my conservatoire studies. I vividly remember the sensation when I used chopsticks to dance. The question filled my curious child's mind of how to use chopsticks to dance rather than eat a meal – the general use of the chopsticks in my home country. I spent two years studying this dance form, and this style is rooted in my body. I did not realise how familiar my body was with this dance style until, in 2018, I tried to explore chopsticks in digital performance. I had not practiced Mongolian chopsticks dance for nearly two decades but could easily recall the movements without thinking.

In *Qi* (Breath), I intentionally avoid using chopsticks like in Chinese Mongolian dance but use them as a sonic instrument in my creation, connecting dancing bodies and the computer through software (Max/MSP and Isadora). For this design, chopsticks provide potential choreographic methods in the creation and trigger dancers to think about ordinary objects in a choreographic capacity rather than be limited to the dance technique. Dancing bodies and chopsticks both become instruments, technology even, in this experiment. Birringer points out that 'By the 1990s, the notion of the musical instrument had expanded to include the dancer in an interactive interface using gesture or movement to trigger sounds or control the sound sequencing' (Birringer 2008: 39). Dancing bodies make attractive and unusual sounds in this scene, stimulating my creative ideas and musician Dee Egan's composition. *Qi*, performed by Miziying Wang, Jiajie Zhou, Rumeng Li and Limeihui Zhu working with Egan, tests the ideas of chopsticks and bodies as sonic instruments, generating data and sounds through chopsticks and bodies. I found that the sound produced by different materials of chopsticks rolling together varies depending on the type of material; for instance, chopsticks made out of wood, bamboo, or plastic resonate very differently from those made out of stainless steel or metal.

This makes me imagine that a bridge of dialoguing with traditional Chinese culture has been built up under the amplifying and processual medium of technology.

On stage left, two dancers, Li and Zhu, enter carrying a three meter long tube, with a microphone suspended from it, as they walk through the space. The microphone cable is threaded through the tube. Their steps trigger lighting, generating a slowly unfolding light corridor downstage. The microphone sensitively detects the atmosphere in the theatre. The quiet mood is changed by dancer Wang moving in from stage right (see Fig. 13). Her movements are mainly on the floor, numerous chopsticks inside her hair – a common if untraditional way for some Chinese women to do up their hair as a practice from daily life.

Fig. 13. Dancer Miziying Wang interacts with a microphone carried by Rumeng Li and Limeihui Zhu on a light corridor. Photo: Haein Song.

As she approaches the women carrying the long tube, she becomes curious about the dangling microphone and begins to play with it listening to the echoes in the space generated by her breathing and touches. These are now picked up by the microphone, to be amplified and processed. Her breath and gesture interact, thus her performance, as Birringer suggests, 'incorporates technologies and associates its compositional ideas with software programming, mathematical and abstract languages' (2017: 107). Live musician Egan manipulates the audio

data in the patch so that the process of Wang's sending signals and perceiving feedback generates an interactivity in the 'kimosphere.' Wang's *Qi,* to use a phrase from an interface analysis by dance researcher Eric Mullis, '… manipulates and responds to projections, sounds, and lighting in real time' (2013: 111), thus her breath actuates the input, so to speak, and Egan responds to her movement and works with the software to generate various effects to enhance the sounds produced by Wang (See Fig. 14).

Fig. 14. Live interaction between dancer Miziying Wang and musician Dee Egan through a microphone. © Photo: Yufei Liang.

3.3 Metakimospheres in Dance Studios

The concept of the metakimospheres was developed in a series of works by DAP-Lab both in theatres and studios: *Metakimosphere no. 1* in March 2015 to *Metakimosphere no. 5* in December 2017.[23] Metakimospheres develop the study of participation, examining the manner in which spectators engage with the material installation and how they become participants in the kimosphere (Birringer 2017). Inspired by the sonic, tactile and kinaesthetic dimensions of this understanding of immersive dance and media in metakimospheres, I propose to use it as a

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[23] There were subsequent *kimospheres* performed in Durban, South Africa (2018) and Trondheim, Norway (2019). For more details, see Birringer 2019, and the website of DAP-Lab: http://people.brunel.ac.uk/dap/.

methodology in this experiment. Applying the theory to dance studios during my process fostered an examination of working methods that allow dancers to be viewed as dynamic elements in the environment and the way they construct and interact with materials in the space, including camera, projection, tubes, chairs, wires and the microphone. In Birringer's study, he perceives smart wearables and installations in the kimosphere as 'entanglement or encumbrance' (2017: 29), referring also to some of Danjoux's complicated and encapsulating chorerosonic costumes and accoutrements (see Danjoux 2014, Danjoux 2017). I would argue that the entanglements and the encumbrances in a kimosphere represent opportunities for choreographers and dancers to generate unexpected and emotional movements in choreography. For example, during rehearsal, the limitation imposed by a wire entangling a dancer's body forces the dancer to escape. The movement sequences generated in this Houdini-like process are strange and fascinating, and they cannot be created without this encumbrance. Moreover, the kinetic atmosphere is co-contributed to by the musician Egan whose sound waves affect the observers. Their motions and emotions also affect the dancer's reactions.

Utilising the concept of metakimospheres as a method in rehearsals, the choreography and improvisation become vivid and allow me to reflect on the different uses of objects or instruments. Dancers during the rehearsals could join the pre-constructed frame any time in any way if they sensed something or if they wanted to contribute to the atmosphere. During the live interaction collaboration with Egan, the software Max/MSP 'provided the stimulus to explore shared and divergent approaches amongst the participants across a range of ideas related' (deLahunta 2002c: 97). In my case, it was the challenge posed by the microphone as a moving and manipulable object. In the test with the microphone, at the beginning, only one dancer, Zhou, stood on a chair and played with the microphone. Wang fond the available space in this scene, then she moved in and made sounds using hand and head to touch or tap the microphone. Zhou's interaction with the space triggered Wang's intrinsic impulses, and the playful interactivity appeared unconsciously (see Fig. 15).

Fig. 15. Dancers Jiajie Zhou and Miziying Wang explore the concept of metakimosphere in the dance studio. Video still: Zhi Xu.

Observing this scene for a while, my intention was to interrupt the game between Zhou and Wang, so I threw numerous chopsticks to the floor. My dancing body did not want to participate in the space, but from the perspective of a choreographer, I wanted to add objects to this space to experience the reactions of dancers. This element triggered a response in Li; she ran into the space, staring at the chopsticks, then slowly lay down on them. She used her back, shoulders and arms to push the scattered chopsticks back to together. The process was recorded by Egan, generating a sound like abstract wind or rain falling on cobblestones.

The sounds generated were my favourites like wandering in the rain and standing firmly in wind. I walked in the atmosphere, stopped, then continued. I carried the chair walking out of the space then stood at a corner to observe other dancers playing at the centre. When Wang noticed my situation, she used the microphone wire to draw me back to the 'stage'. I left the chair at the corner. I put the microphone on the floor to record the sound of the chopsticks generated by Li. She was fully concentrating on the objects, and I felt strongly that she was narrating a story in this space. My sensation linked to hers, and I lay down on the floor to perceive more. Wang and Zhou noticed our non-verbal dialogue and joined us. Wang sat on my back looking in the opposite direction while Zhou moved her body to face Li. The kinetic

atmosphere became content, interactive and complete. The atmosphere was not limited to the 'stage' with dancers, but interacted with the outside of the 'stage', the corner where musician Egan was sitting interacting with us through their computer (see Fig. 16).

Fig. 16. Rumeng Li plays with sonic chopsticks; Jiajie Zhou, Zhi Xu and Miziying Wang participate in the kimosphere. Video still: Zhi Xu.

The skeleton of a metakimosphere was explored in the rehearsal studio; we played in this atmosphere for nearly one hour. We did not notice the time but sensed the environment, touching objects, adding stories and participating in or running out of the centre. All things happened in the shared space.

3.4 *Xiqu* in the Kimosphere

In rehearsals, Wang's breath caught my interest. She trained professionally with *xiqu*[24] when she was a child. She said, 'I planned to be a professional *xiqu* performer before training in dance. I have a good voice which I think I inherited from my mother, who likes *xiqu* very much' (personal conversation, dance studio, May 2018). *Xiqu* is too familiar an art form to me, so I did not initially consider it in the digital sense. Then I became curious how it would function in a digital environment, so I asked Wang to sing *xiqu* in the scene *Qi*. Egan recorded

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[24] *Xiqu*: also known as Chinese opera.

it live to give feedback. At the same time, I worked on an Isadora patch to generate an abstract ink painting, forming a dialogue between her sound, projection and lighting.

Wang was excited as she had not experienced her *xiqu* voice in this way before. The rehearsals developed in exciting ways. The stimulation that happened in the kimosphere triggered the people involved in this space to develop their sensation according to the environment in the ways of choreography, composition and animated graphics. Preprogrammed images triggered by Wang and her dancing body as 'data' were processed in both the physical space and cyberspace. Wang's body also was an interface in this atmosphere connecting real and virtual spaces. The ink painting of fishes, which I projected through the software, was meant to be an amplification of her interior landscape (see Fig. 17). In rehearsal, as deLahunta suggests, 'instructions stimulate a certain interior landscape of thinking that should bring "intentionality" to the dancers' performance, rendering visible what the dancer is paying attention to during execution of the instruction or task' (2017a: 111). DeLahunta points out Wayne McGregor's choreographic method, which I also used in the choreography of *Qi*. This method leaves spaces to dancers who can develop according to their understanding of the images I described, just as Wang did (she is a professional dancer who graduated from Beijing Dance Academy). She understood my instructions and explored the task deeply. We stimulated each other during the rehearsal.

Fig. 17. *Xiqu* sung by Miziying Wang generate the ink paintings of the projected graphics. © Photo: Yufei Liang.

3.5 Violent Stimulation behind Sonic Chopsticks

The potential to inflict violence through chopsticks has drawn my interests for a long time. Can I use chopsticks as a tool to represent bullying, poking, or manipulating? I brought these thoughts into the work and unfolded them in a kimosphere. Spectators observed the scenes on the stage according to their own life experiences. I arranged sequences of Zhou and Li pulling out the chopsticks on Wang's hair, then used the chopsticks to push one point of Wang's body. Wang perceived the push then moved generating emotional movements automatically. When the energy lost out, she froze in her step, waiting for the next push. The task for Zhou and Li was to find the hidden space on and behind Wang's body somewhere that might be difficult to notice, making Wang uncomfortable, irritating her. I noticed that at the beginning, Wang moved gently and did not resist the behaviours from Zhou and Li, but following the intensive bullying behaviours and bad manners toward her, Wang resisted in her own way. It was difficult to deal with the attack from two people at the same time, and I felt Wang's anger strongly from her breaths. The noisy sound effects in the atmosphere enhanced her emotion. I also asked Zhou and Li to use chopsticks to take out Wang's tongue, to drag her lips and eyes, in the way of eating a meal on the stage, to 'eat' the body (see Fig. 18).

Fig. 18. Bullying in sonic chopsticks by ensemble. Video still: Graeme Shaw.

Wang's actions did not meet my expectations. She did not fight back but avoided the bullying movements from others. She even used her hair to protect herself (see Fig. 19). But Wang's behaviour did not stop the bullying. I found these kinds of movements difficult to choreograph, but the gestures were generated automatically if the atmosphere was constructed. The scene triggered my curiosity, prompting a reflection on choreography, contact improvisation and codified movement in dance. For example, is it necessary to compose emotional movement phrases for dancers? How might a scene be created in which the choreographer provides a motif without actual choreographed movements? Considering these questions is vital to this creation.

Fig. 19. Exploring violent emotion through sonic chopsticks. © Photo: Yufei Liang.

3.6 *Xun* (Looking For) – Sonic Chopsticks as Metaphor

Another scene exploring sonic chopsticks is *Xun* (Looking For). The choreographic method for this scene is different from *Qi*, which uses chopsticks to push or bully a body. In a metaphorical way, it considers cultural identity and nostalgia. *Xun* is a duet performed by Rumeng Li and myself in separate spaces. Our physical bodies never touch but are connected closely through sonic chopsticks and the dialogue conducts between us in the separate spaces.

I consider chopsticks to be an object of cultural identity that stimulates my 'interior landscapes' (deLahunta 2017a: 111) and body memories. My mother told me that I learned to use chopsticks earlier than other children. I cannot prove it, but I can recall using chopsticks to eat meals since I can remember things. Chopsticks cause me to think about cultural identity and how environments can change people's behaviour. The change happened when I arrived in the UK. I realised that I do not use chopsticks everyday anymore. Cutlery appeared in my kitchen due to the change in my eating habits. My taste in food is also gradually changing as well. In addition, I use English to communicate with people around me, and I realise how language changes peoples' ways of thinking. For example, in using English, people tend to give the

answer first when asked a question. Then they might explain in further detail. In contrast, in the context of Chinese conversation, people tend to express what they think then give the answer at the end. My body as a container is still mixing different cultures every day to generate my own ways of moving and thinking.

Using sonic chopsticks as a metaphor in *Xun* indicated cultural inheritance and descent, and I constructed a dialogue between my body abroad and my hometown body in separate spaces. Using this imaginary situation, I tried to perceive and relate to chopsticks held by Li, using my responsive body to embody the emotion I felt in this atmosphere (see Fig. 20). The air in this space was stirred by Li. She generated sounds through chopsticks, rolling, tapping and squeezing, and I clearly felt the energy and the emotion between our bodies constantly change. In and through our ongoing relationships, the affective impact in this space became clearly noticeable: 'a sentient environment can inspire dynamic bodily inscriptions, as forms, matters and sensations unfold' (Birringer 2018: 468). The lighting and sounds in this atmosphere amplified my nostalgia. I felt the energy from spectators as well, their breathing changed the quiet and sensitive atmosphere, and the kimosphere was not limited to the stage. As Birringer points out 'Atmospheres, strictly speaking of course, have no outside' (2017: 29).

Fig. 20. Dialogue through sonic chopsticks in the kimosphere by dancer Zhi Xu and Rumeng Li. Photo: Min Zhang.

My dancing body in this process dragged materials, lighting, sounds and projections into the kimosphere. The space of the stage separated into different layers that inhabit various qualities (or expressions) of my dancing body. Dance scholar Katja Kolcio in her somatic and technology research points out that:

> New technologies have changed the way we interact with our environment, with each other and even with ourselves. Clearly new technologies, like the computer and the digital video, effect new experiences – the task is to understand the shifting landscape of an advanced technological age. Although they are commonly placed in opposition to one another, both dance and technology explore the interaction between the body (the person) and the environment by challenging the parameters of what the body can do and experience (human potential). (Kolcio 2005: 103)

My dancing body in this digital environment expanded the possibilities. During the process, I realised that I utilised my body to narrate a story that described my sensation at that moment and stories that happened in my life. The chopsticks also seemed like the bones in my body. Li rapidly rubbing the chopsticks caused my body to shake. The inner connection and visual interactivity between my movements and the chopsticks constituted a dialogue between my dancing body and my homeland. Li constructed a 'forest' on the right side of the stage with 80 chopsticks, and my dancing body 'flowed into' this environment in my imagination. I tried to find the way in this 'forest' with the questions about where I come from and who I am (Fig. 21). The sound made by Li led me to find my hometown, but the fog in front of me hid my eyes. I suddenly fell to the floor, which dragged the lighting and sound down into darkness at the same time in the theatre.

Fig. 21. Nostalgia in a kimosphere by Zhi Xu. Photo: Min Zhang.

3.7 Codified Movements without Technology

Dong (Move) represented choreography without the intervention of technology. Most rehearsal time spent on this scene concentrated on the design of movements, duet lifts, cooperation between dancers during movement, and changes in movement rhythms. I needed to design the movements first, then teach them to the other four dancers. I asked all dancers for accuracy in their movements and rhythms, and we therefore spent considerable amounts of time rehearsing adjustments. The movements were choreographed by myself according to my habitual movements. However, when I taught the movements to other dancers, the choreography needed to change according to their own interpretations.

Despite our passion, the feedback from audiences was that *Dong* resembled modern dance from the 1940s or 1950s in that it contained few surprises. This feedback did not exceed my expectations. In designing this scene using codified movements, I aimed to combine traditional and digital choreography so that audiences might have a comparison. However, through analysing both recordings of the piece and audience feedback, it is nonetheless possible to study differences in choreography between digital and non-digital environments.

3.8 Summary

In *X-Body*, I paid attention to dancing bodies trained in Chinese dance and chopsticks collaborating with sonic equipment, software, lighting and dancing bodies. I used techno-choreographic methods to explore sonic chopsticks in a kimosphere. Chopsticks as an interface, used in codified movements and improvisations to generate sounds, bullying behaviours and as a metaphor for nostalgia. In the process of creation I explored Birringer's theories of choreographic systems and metakimospheres considering cultural knowledge and body memories. I also used a choreographic system to unfold cultural identity in a kimosphere that is constructed by intervening dancing bodies, objects, software, live interactivity, sonic equipment, projection and lighting.

Using the notion of metakimosphere as a methodology in dance composition, for *X-Body* I constructed a shared atmosphere for dancers, musician and visitors (colleagues and friends visited our rehearsals many times, invited to join in the kimosphere) to participate at any time when they felt intrinsic impulses. The scenes constructed by others in the environment stimulated the recall or sensation of the participants, like dancer Wang using *xiqu* during rehearsals to play with the microphone. My body's memories of Chinese Mongolian chopsticks dance were triggered in this space, and musician Egan manipulated the sound (with Max/MSP software) to be interactive in the kimosphere.

The choreographic systems used in this research contribute to the exploration of cultural identity in digital performance. The intervention of a microphone, projections and software provided a wide landscape for me, as a choreographer, to consider the functions and aesthetics of chopsticks and *xiqu* in digital performance. For example, *Qi* has presented the idea of sonic chopsticks. Dancing bodies and technological equipment engaged through choreographic systems, unfolding a kimosphere for the participants on the stage and the audience to share in and contribute to this environment. As Karreman argues, digital choreography provides an environment in which dance workers '… develop a new awareness of their own body and its movement as a tool or corporeal strategy' (2018: 505-506). Birringer's metakimospheres have pushed the study of choreography and technology further, incorporating research of participation, ecology, psychology and body awareness. I summarise four points after the creation of *X-Body*:

1. If digital projection is only used as a background, audiences might easily lose interest. If there is no interactivity or connection between the projection and the movements, the dance cannot be improved through digital technology, and vice versa. Audiences have already seen exciting 3D, 4D, 5D, and IMAX films in cinemas and other entertainments that use a variety of means to stimulate the audience's sensations. Nevertheless, dance in association with digital technology could provide richer sensations to audiences through displaying the connection between a dancer twisting her waist, and the digital double becoming distorted in the projection at the same time. Dance is a live art and audiences could feel the physical exertion and breath involved in dancers' movements, lowering the barrier between them and audiences. Therefore, through a choreographer's designs, audiences could even closely perceive winds generated by dancers' fast movements and dancers' breaths becoming a kind of sound in real-time compositions. The liveness here is transformational: the interface technology does not 'capture' a dancer's movement as much as it allows the dancer to transform with the digital conjugations. The conjugation, at the same time, can affect perception of what a cultural object (chopstick) is, and is used for.

2. Digital technology used in dance can trigger the emotions of dancers. For example, *Qi* (Breath) was conducted through Wang interacting with a microphone that amplified her breath. In this scene, I wanted to explore the breath as a sound in dance. To that end, I hung a microphone on the ceiling of the studio, then attempted varying means of interacting with the microphone before playing the 'processed sonic' back through Max/MSP. The movements and structure of *Qi* were created in relation to a considerable number of impromptu interactions in which all that was required of me was to adjust the scene's structure rather than choreograph any movements. Instead, Wang choreographed all movements and the movements of the microphone in the space. This kind of creation would not be possible without the intervention of computer-based technology (Max/MSP) and a microphone.

3. The dialogue between a dancer and a virtual partner through a web-camera provides imaginary scenes. I created this part by choreographing movements first and then teaching them to the dancer, Zhou, altering the order of the movements and techniques according to her movement habits. I aimed to construct an interaction between Zhou and the virtual partner generated through a web-camera projecting images onto a screen upstage. Technology provided another positive effect in that, when the virtual dancer appeared on the stage through projection, Zhou could remain motionless, thus allowing audience attention to focus on the

virtual figure she generated. In addition, I calibrated the patches of Max/MSP/Jitter to change the numbers and volumes of the settings, thus enabling the shapes and speeds of the virtual dancer to be transformed. In developing the choreography of working with the virtual dancer, I observed the visual effects on the projection generated by Zhou, noted the virtual dancer's abstract movements, and then asked Zhou to imitate them. The unexpected movement motifs created through this re-generative feedback method are unpredictable and thus creatively challenging; this constellation could constitute a new method of teaching choreographic classes in higher education.

4. The intensity of lighting affects the visibility of the projection. I used two projections in the scene of *Chan* (Twist), one projecting on the back of the stage and one on the floor. The intensity of lighting reduced the effects of the projections. This experiment provided vital experience in testing digital images with lighting before completing the patches of Max/MSP/Jitter or Isadora. In my piece [the scene in which I dance a solo], because of the projection on the floor, the intensity of the lighting should not be too strong. Due to this, I (as the choreographer) needed to change the position of the movements because a dancer is required to find the lighting so that the audiences can see their dancing body clearly. Projecting digital images on the dancing body offers considerable potential. How to integrate with the images, and how to separate from them to reflect the independent dancing body were constant considerations in the choreography. When I was lying down under the projection, I could feel the digital smoke rising and hitting my body. Even though my body was still, from the audience perspective I appeared in fact to be moving in the atmosphere. Despite no continuous movements being needed, a still dancing body could generate surprise both to audiences and the dancer himself in this situation. The question of how light and projections behave – making a dancing body appear in a certain way – and how sound carries or animates reverberating perceptions in association with a concrete cultural object (chopsticks), has implications for an understanding of material, dimensional and spatial composition. The embodiment of Chineseness in such techno-choreographic articulations begins to become synchronous and mixed up with technical (lighting and audio technology) and coding operations (digital transformations).

In conclusion, this first practice-based experiment in my research opened a new pathway, as yet not conclusive but clearly indicating to me that choreographers need to equip themselves with knowledge of digital design so that the technology used in creation can enlarge

movements and expend ideas. I speak carefully of enlarging here as I could observe myself feeling still quite attached to, bound to an inherited sense of needing to be in control, directing and choreographing, bringing forth my cultural knowledge and sensibility of movement creation. However, as a choreographer, I also came to realize it is no longer enough to only consider the design of movements, the development of motifs and narrativity through dancing bodies. What is important in the relation of choreography to digital technology is how to develop dance through digital images, sensors, camera vision, spatial dimensions (for example the near and far, low and high positioning of screens and other objects) and installations. To understand and master computer-based technology, it is essential for a choreographer to explore the realm of dance technology in its interactional potential and impact on movement experience (which is always a cultural somatic experience as well) and spatial-auditory awareness, while at the same time also observing and testing how embodied forms of knowledge—the kind of kinaesthetic improvisations I described above, for example of the dancers acting upon the swinging mic or the fallen chopsticks—meet and inform the intelligent machines, hardware and software, the loops of feedback.

Chapter 4. *Mourning for a dead moon*

Mourning for a dead moon is a digital performance that involves dance, theatrical stand-up comedy, real-time interactivity with wearable sensors, live sound, projections and software programming. It was staged with scenographic installation designs developed for the particular visual leitmotifs that concerned the thematic subtexts of the performance and their focus on the climate crisis. The work was developed through a long series of rehearsals conducted over the course of a year (October 2018 through November 2019) during which I was in continuous dialogue with Johannes Birringer and members of the DAP-Lab. In fact, it was probably this lengthy rehearsal process, in a smaller black box theatre where I was able to try out many small but significant sensor and sound tests (with the Sensestage MiniBee hardware and software developed by Marije Baalman at STEIM), which inspired me further to question and interrogate choreographic principles as well as probe the relationships between sensing and touching moving objects, learning from affordances of objects, textures, materials and comparing tactile knowledge, inhabitation, ecological tuning, etc., to my own inherited and evolved transcultural sensibilities. In a personal sense, I also wondered how my ideas about nostalgia – and the lived distance to my home land and habitat – become altered or disentangled in a production environment of artistic research where so much emphasis is placed, not on melancholia and mourning, but on the playful, even ironic, side of technics, on 'wearing' new devices and materials, as well as on the uncanny side of a 'speculative realist horror' that can be associated with 'ecological emergency' of a trashed uninhabitable earth (Morton 2016: 140; 150).

The first public presentation of *Mourning for a dead moon* was at Artaud Theatre, Brunel University London on 7th December 2019. This collaboration also let me work closely with Michèle Danjoux, fashion designer and co-founder of DAP-Lab, whose innovations in costume design inspired me to think deeply about dance composition and my roles in the production. In addition, I worked with several other dancers from different cultural backgrounds (Macarena Ortúzar, Yoko Ishiguro, Helenna Ren), the sound artists Dee Egan and Louie Marlow, the electronic designers Maria Dada and Ragnar Hrafnkelsson, and with lighting designer Charles Manister. The year-long series of test rehearsals and the staging of *Mourning for a dead moon* became a very fruitful experience for the second stage of my practical investigations. It also allowed me to step back, in a sense, from the role of

producer/director leading the choreographic process. I entered into a laboratory ensemble that is completely multicultural and interdisciplinary, with a horizontal process that was very refreshing for me. We improvised a lot.

4.1 Experimentations: *Whisper Room*, MiniBee and Sensestage

The rehearsals for *Mourning for a dead moon* were an open-minded creative journey where we constructed performing environments together. I found movement motifs from the process of setting the stage, hanging gels, microphones, LED lights, after bringing objects to the rehearsals to create 'kinetic atmospheres' (Birringer 2017: 27) and test the potentials for generating and processing live sound. I then developed my movement phrases based on this continuous stimulation from the digital and mixed-reality environments. *Mourning for a dead moon* was my first time participating in a DAP-Lab production from the beginning to the end. The initial experimentations were in 2018, and stretched into the early summer of 2019. Finally we rehearsed weekly from September 2019 onward. The rehearsals did not always involve all participants of the DAP-Lab together but were dependent on individuals' schedules. Normally, we worked in a black box theatre for several hours in the evening. No matter how many people participated in the rehearsal each time, the kinetic environments were unstable, i.e. they always changed slightly or sometimes drastically, new organic or synthetic materials were added, inviting interaction and repositioning. Sometimes guests artists showed up as if from nowhere, passing through town, such as Iranian performance artist Sahar Sajadieh, and then worked for a whole evening with us. On another night, a stand-up comedian showed up and worked with us, and then I never saw her again.

One of our test rehearsal processes was titled *Whisper Room* and was produced during experimentation in late 2018, exploring the relationship between a dancing body, a microphone and live sound. In this work, I focussed on the generation of sound, especially how sound was generated through my dancing body. I was interested in recording the sounds generated by my movements, which included my breath, the sound of the body hitting the floor, the friction between the body and the floor, touching the microphone and the flapping of limbs.

The hanging microphone determined the space where the body could move. Due to the limited space, my body automatically invoked techniques that I trained in to deal with such a situation. When I studied the footage, I found that I had used several Chinese dance techniques in this work. *Dantian*[25] is a significant concept in Chinese classical dance and I emphasized *dantian* approaches to developing movement in this test rehearsal. For example, when the abdomen touched the floor, *dantian* controlled the axis and the energy of the body to complete the rapid rotation; through *dantian* control I folded my upper body and lower body at the same time. Looking at the feet, the form of *kuai jiao*[26] appeared regularly in the work. *Kuai jiao* refers to turning the feet inward to form arc shapes, which are typical shapes in Chinese classical dance. Forms of *kuai jiao* can be found in the works of Lin Hwai-min and Shen Wei. *Kuai jiao* not only represents the aesthetics of Chinese dance but also utilises its mode of expressing the state of a character's inner tension in Chinese dance works. When I moved under the swinging microphone, the compressed space triggered my body memory to transfer Chinese classical dance techniques in this work to *kuai jiao* as a result. This technique embodied my body emotion in this situation. All sounds were generated during the movements, recorded by the microphone, and then processed live by the musician Egan.

The experimentation of *Whisper Room* was significant in my research. That experimentation was developed further in *X-Body*, the first dance work from my research to premiere in September 2018. *X-Body* combined *xiqu* singing by Miziying Wang and real-time interaction through Max/MSP by Egan. Choreographic ideas were generated based on my and Wang's training backgrounds both in the Chinese classical dance techniques utilised in *Whisper Room* and in the digital *xiqu* singing in *X-Body*. Our body memories in-formed the process of techno-choreography.

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[25] *Dantian* (丹田) or energy enter is an important concept in Chinese classical dance and traditional Chinese medicine.
[26] *Kuai jiao* (侩脚) is a basic movement focusing on the feet in Chinese classical dance and the movement originally came from *xiqu.* The relationship between *xiqu* and Chinese classical dance is discussed in Chapter 1 and my reflections on Chineseness.
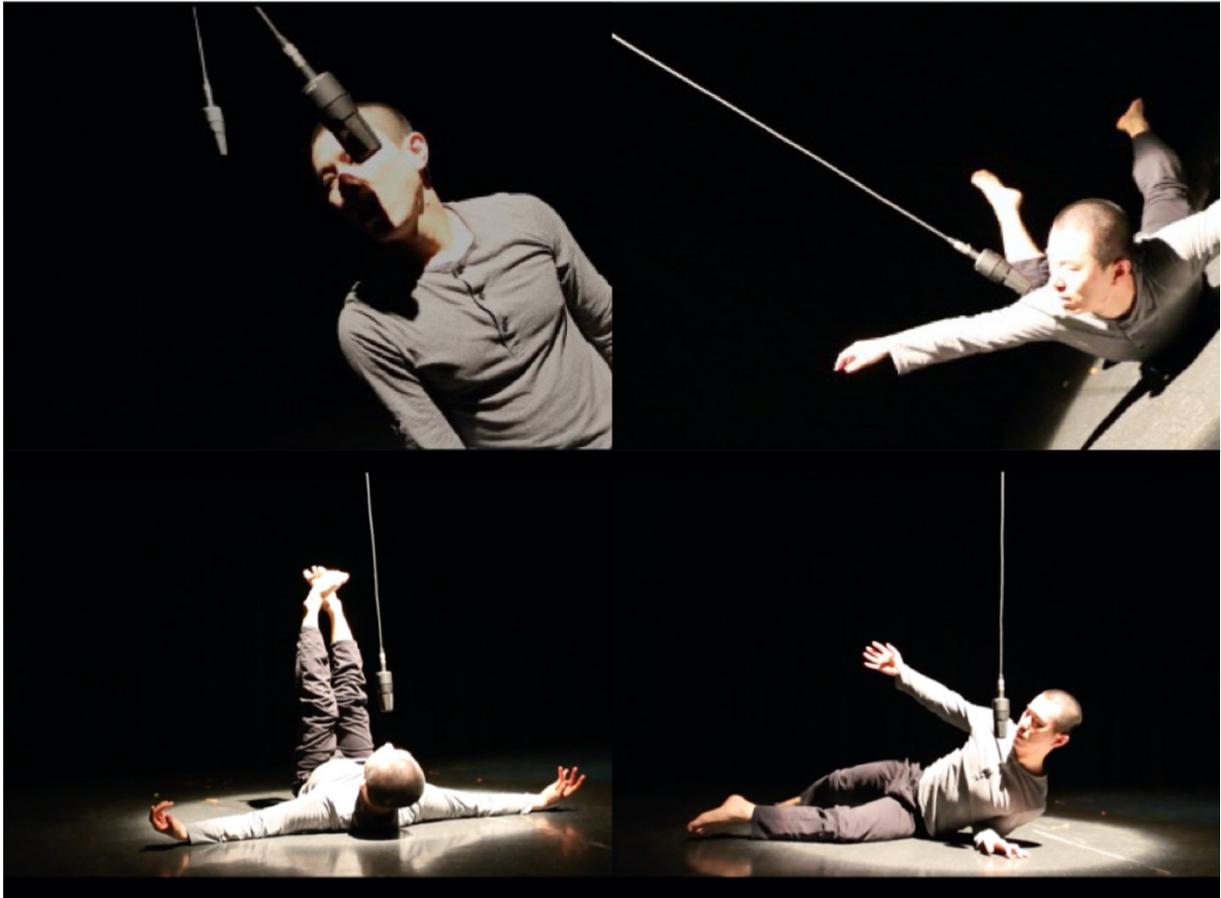
Fig. 22. *Whisper Room* rehearsal, Zhi Xu performing with microphone, March 2018. © Photo: DAP-Lab.

Experiments with the Sensestage MiniBee (tiny wireless sensor-controllers worn on the wrists inside a very small velvet wristband) were inspiring for my research. MiniBee is a small wearable sensor that can transform the data of a dancing body's speed and effort to a computer and trigger live sound through Max/MSP software. In an interactive installation or an immersive experience, the audience can enjoy the sound and images generated through a sensor or Kinect camera. In my research, however, I was examining this interaction from the perspective of a choreographer, thus considering how trained dancing bodies are interactive with the sensor MiniBee and how the sensor helps the process of dance composition. I found that Birringer, Egan and I were each focusing on the sensor in different ways. Birringer concentrated on the generation of live sound and its changes; Egan emphasized the sensitivity of the sensor and the patches, and also used his voice increasingly in these rehearsals, interconnecting sensor, microphone and feedback processing loops; and I paid more attention to movement phrases. The manipulation and generation of live sounds was fascinating. However, my primary intention was to explore how the sensor helps movement generation and the process of choreography in techno-choreography.

Fig. 23. MiniBee experimentation by Johannes Birringer, November 2018. © Photo: DAP-Lab.

Fig. 24. MiniBee experimentation by Dee Egan, November 2018. © Photo: DAP-Lab.

Fig. 25. MiniBee experimentation by Zhi Xu, November 2018. © Photo: DAP-Lab.

Fig. 26. MiniBee experimentation by Zhi Xu, November 2018. © Photo: DAP-Lab.

I wore one MiniBee on my wrist and one on my ankle. In Chinese dance, there are many foot movements that represent different emotions and narrativity in Chinese classical dance and Chinese ethnic and folk dance respectively. When I worked with the sensor, I needed to leave time for the software to respond. When I paid attention to the gap, the duration of a movement

sentence changed. Working with the sensor changed my movement generation and it interrupted the movement constructions (taking into account the speed and effort of the movements). The cooperation helped me to look at the details of Chinese dance in gestures and footsteps. Without the intervention of the MiniBee, it is difficult to think about movement generation in this way. Working with the sensor contributed to the imagination of movements in my experimentation. It was no longer enough to simply generate live sound. The sensor triggered reflection on the trained dancing body in choreography through the method of improvisation.

Fig. 27. Matsutake rehearsal, Zhi Xu wearing MiniBee with mushrooms, November 2018. © Photo: DAP-Lab.

Each rehearsal was unrepeatable due to the method of improvisation we used. But the kinetic atmospheres became more intimate as we moved along and began to understand each other better during rehearsals. I observed Birringer's movements of throwing fishing wire up into the crossbar rigging and then suspending objects with these wires, and how musician Egan deployed their equipment and cables. We were independent working in the studio together, but we connected to each other from the perspectives of observers and movers.

While we were setting the stage, the relationships of the observer and the mover changed regularly. Egan adjusted the soundtrack while I was slowly moving to warm up. My body listened to the sound and observed the rhythm. During rehearsal, I moved in the space, then

Egan observed my movements and manipulated the sound. I also noticed that Birringer had to throw the fishing wire, tied around gaffer tape, upwards across and over the lighting rig (as we did not have access to a very tall ladder that would have been needed to attach the wire to the lighting grid) so to be able to hang various objects (microphone, gels, paper, gauze and fabrics) from the wires and build the scenographic installation. I carefully observed his movements. This throwing technique is a delicate act. How many times would he need this time (just one try or three or five times)? How much effort did it take? How did the thin, barely visible wires stretch across the space?

Afterwards, when I moved through 'the body of the architecture' (Birringer 2017: 27), he observed my movements through his camera lens. I did not specifically pay attention to Egan's or Birringer's behaviours, but my sensitive body always perceived the changes in the shared environment. The process of setting the stage and lighting the objects became a motif of my movements in the following rehearsals. From the moment we entered the black box studio and began to work on the 'setting' of the kinetic environment, our rehearsal process had started. There was no formal rehearsal in an empty or prepared theatre. The preparing and modifying of the space were already a part of the dance.
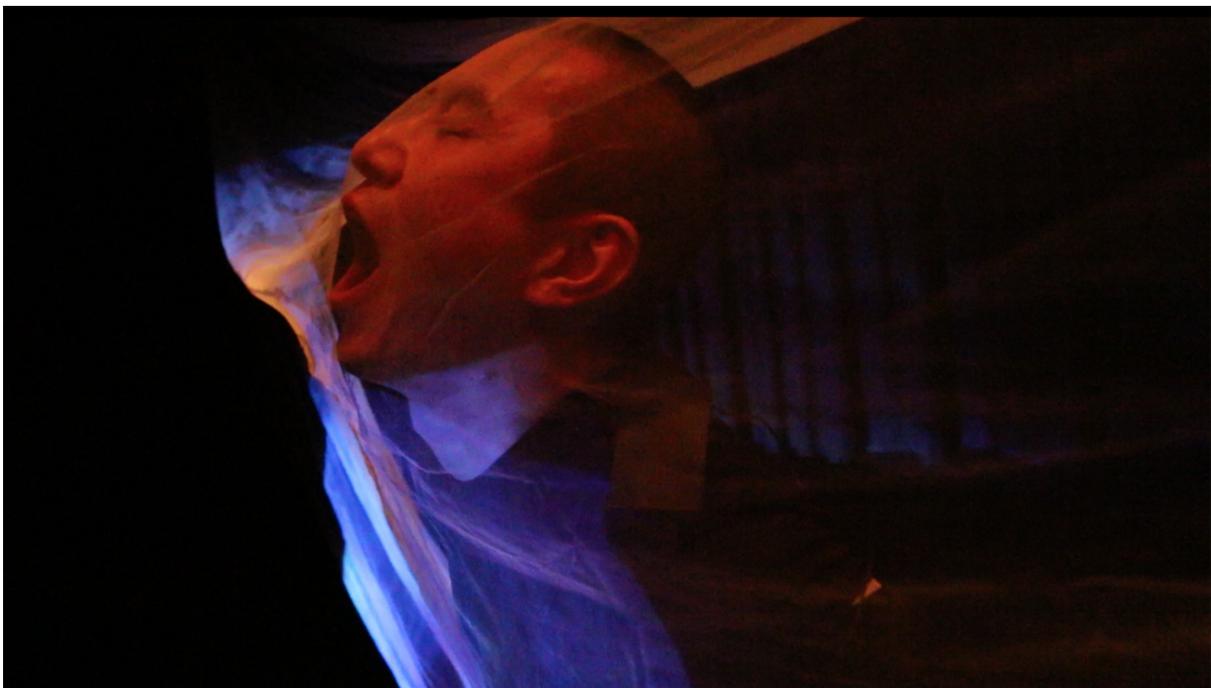
Fig. 28. Rehearsal, Zhi Xu with fabrics and video projection, December 2018. © Photo: DAP-Lab.
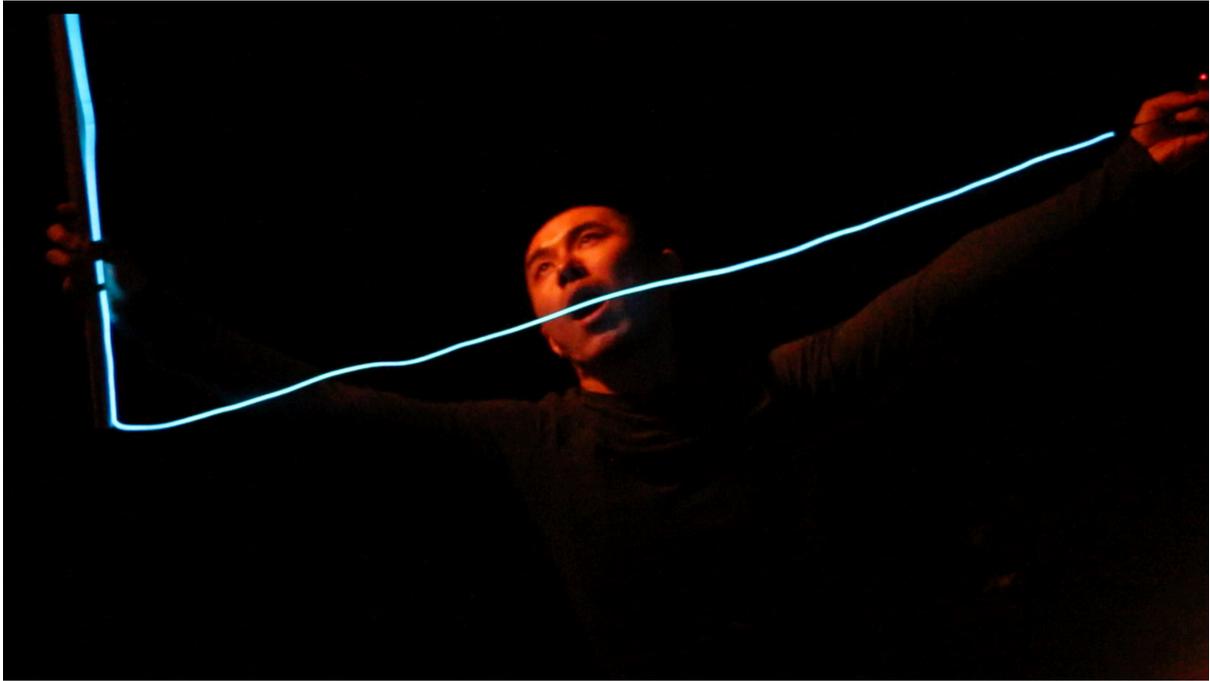
Fig. 29. Rehearsal, Zhi Xu with blue LED light pole and luminescent wire, June 2019. © Photo: DAP-Lab.

When all our installation and music equipment was settled, all participants during the rehearsal examined the constructed environment in detail. As one of the choreographers and dancers in *Mourning for a dead moon,* I brought memories and sensations to the environment. I observed, entered and interacted with the suspended installations, the objects and wires stretched across the space. I embedded my dancing body into this atmosphere. I left the environment to observe whether my movements changed anything in the environment. Birringer's idea of *post-choreography* also applied to my experimentation, in the sense that the kinetic environments we built were also sensing environments and nervous systems that - in a way - were observing us. In such systems there are invisible parameters, provided by the configurations of the software patches or by the angles of the camera vision system or field of view. I accessed 'sound and image synthesis parameters, moving between programmed patches and changing the qualities of digital manifestations from movement to movement' (Birringer 2008a: 118). I was also inspired by David Rokeby's *Very Nervous System* when working with MiniBee.

> *Very Nervous System* (1983–1991) is a system that translates human gesture into sound. I called it *Very Nervous System* because it represents a simplified fragment of human perception, judgment, and expression mechanisms. It has a complex sensor (usually a video camera), a perception system, a "voice" (usually a synthesizer or sampler), and a set of "opinions" about how human movement

113

should be translated into sound. These opinions are implemented as computer algorithms; they translate the moving image into sound, and for this there are no objectively "correct" models. (2019: 90)

The sensor I wore on my wrist triggered the changes in the sound patches on Egan's computer, and the sound stimulated by my movements also affected my imagination about the environment. This kind of interactivity is what Rokeby argues regarding *Very Nervous System*. The sensing stage absorbed my dancing body. The swinging objects, the fabrics, gauze and projected digital characters/graphics inspired my improvisation. I tried to improvise and interact with the objects and graphics with my own ingrained cultural sensibility. In the exhibition of *Very Nervous System*, people with no professional training background walked into the system to generate sounds. I investigated what kind of data Chinese dance generated and examined how different sounds were generated through particularly inflected and accented Chinese dance movement sequences.

Fig. 30. Moving between the digital and the material installation, winter 2018. © Photo: DAP-Lab.

After rehearsals every time, we carefully collected objects and materials we had used. This process as a part of the rehearsal was even more interesting for me, as it was like a reverse order: taking down installations, disconnecting cables and interfaces, collecting the mushrooms and the mulch, putting the lighting control table back into the case, and turning

off the lights of the theatre. What did we leave to the theatre? I gained new perceptions of the shared environment; I knew the collaborating artists more intimately than before, and my dancing body learned 'sensorial-embodied perception approaches' (Birringer 2019: 101) during rehearsals.

My training background in Chinese dance and my body memories are important when I engage with digital environments. The sensation of the digital environment is based on my trained dancing body and the embodiment of moving in the digital involves the skills of how I deal with the environment, sensors, and projection and sound equipment. The instinctive movements of my dancing body are based on my training background; in other words, I respond to challenges in these rehearsal environments by improvising with conscious and unconscious techniques that are inflected into my body and somatic knowledge. My understanding of the digital environment I engaged with in *Mourning for a dead moon* rehearsals involves the aesthetics of Chinese dance and the techniques in which I trained since I was a teenager.

4.2 CryptogamicLightCape

Under the moon, a breeze blows in the dark night, and the natural environment is quiet. Mushrooms, trees, tree stumps, mulch, leaves and plastics are vaguely visible. Moonlight sprinkles on the ground and moss grows on bushes. Logs are stacked in one corner beside a branch thriving in this unusual environment. Cryptogamic plants rapidly grow on this wet and fertile land. The mouth on the moon narrates what happens under the moonlight every night. The moon observes people coming and going, numerous stories of happiness and sadness. Blue lights appear and float in the dark.

The scenography described above was designed by Birringer, and the CyrptogamicLightCape costume was designed by Danjoux. In Danjoux's research of *design-in-motion*, she argues that the costume design intervened at the beginning of performance to 'augment both body and process by provoking new movement choices' (2017: 1). As a choreographer and dancer in this piece, the LightCape expanded my imagination in terms of the movement design. My dancing body was combined with the costume, which gave me stories to represent in the digital environment. The exploration of wearing the cape and moving in the dark was

unusually difficult and troubling. The weight of the cape forced me to develop movements focusing on my torso and to pay attention to *dantian* when I move with the LightCape. So, my movements and the choreographic structure were inspired from the heavy materiality and the design of the cape. It had expanded the possibilities of the space I can occupy and reach in the theatre. Yet the dancing space, my environment, is completely dark, there is not light. I dance in the dark. The LED lights on the cape that wrapped around my body generated their own spirits after I turned the lights on. The lights wrapping my body (inside) presented a digital figure, and the piece was my process of dialoguing with the electronic costume. The intention of this work was not about wearing technology; as Danjoux stresses with her design, wearables are 'poetic statements' (Danjoux 2017: 220). The scene was narrated by my dancing body and the wearables.

Fig. 31. CryptogamicLightCape and digital figure, December 2019. © Photo: DAP-Lab.

The initial experimentation of this piece was working with the LED lights provided by DAP-Lab. The electronic equipment gave me the idea of cutting space through the lights and stirring the atmosphere and how to move in and out from the spaces constructed by the LED lights. The light line could spin quickly in the space, which a dancing body cannot do, and when it attached to objects (like a tube or a tree branch), the function of the lights changed. I made sounds through waving it, and live musicians recorded it and processed it.

116

Danjoux designed the LightCape, which combined the LED lights and the heavy black velvet cloth. It was fascinating to see how the light combined with the cape and how the function changed when they all became one garment or constituted the idea of a light-growing/cryptogamic envelope. This design expanded the possibilities of the opening scene which I wanted to dance entirely in the dark, only the LightCape becoming visible at times when I opened it to let some of the lights 'escape', so to speak. The movement design changed according to the costume. From the perspective of choreography, I imagined the small lights attached to the cape like numerous mouths, breathing the fresh air and whispering in this dark magical environment. My body was a carrier, floating and listening to them. The LightCape had its own images and languages.
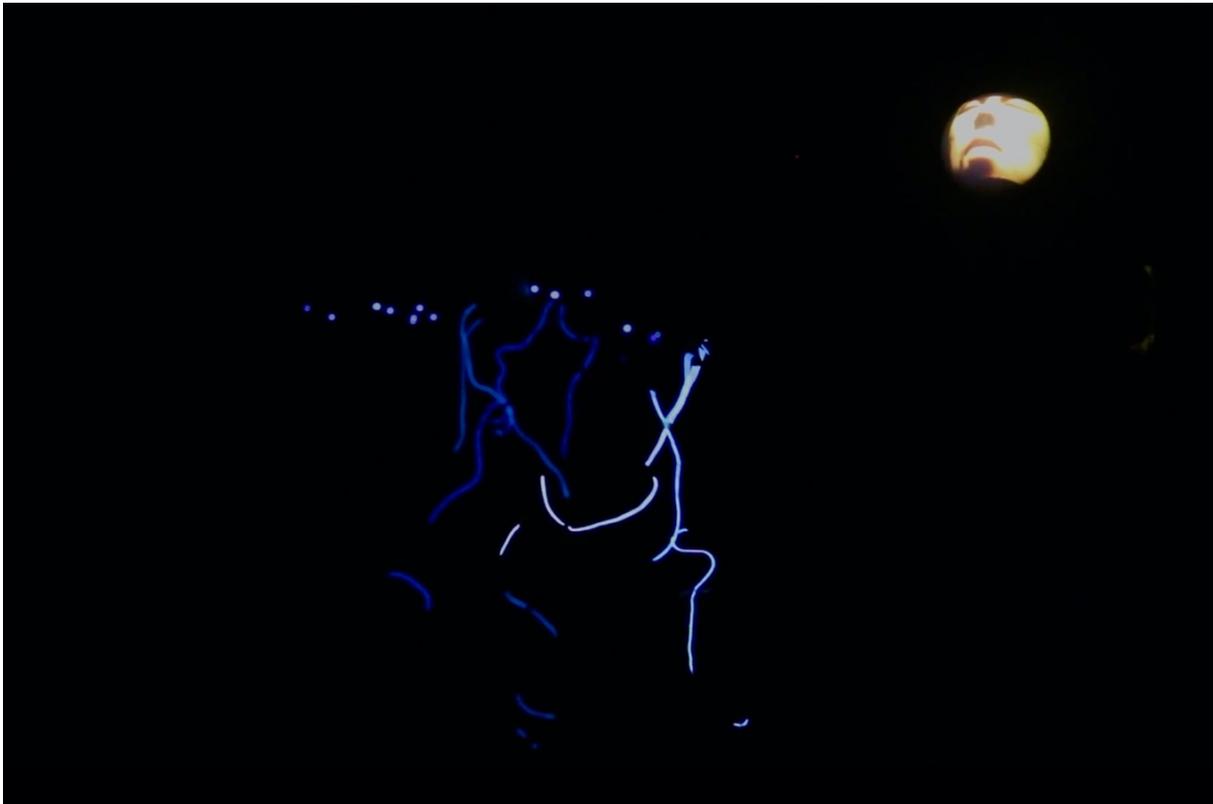
Fig. 32. CryptogamicLightCape and digital figure, and the moon mouth. December 2019. © Photo: DAP-Lab.

Fig. 33. Zhi Xu's face on the moon, December 2019. © Photo: DAP-Lab.

Under the LightCape, my body was also wrapped with lines of electronic lights. When I took off the cape, an abstract figure was outlined. In this piece, I did not focus on what kind of movements I should create, but I paid attention to what kind of sensation the garment brought to me, then I built up movements. When I look at the filmic footage, I am curious. Is that me? From the footage, it is difficult to recognise myself. It looks like my corporeal body does not exist, only the abstract figure, sometimes dots of light, sometimes sinuous curves of milky blue light. It also resembles an animation moving in the dark. The wearable can blur a dancing body when the dancing body is deconstructed by the wearable. Techniques or skilled dance movements are not important in this situation.

Fig. 34. CryptogamicLightCape and digital figure, December 2019. © Photo: DAP-Lab.

4.3 Plastics

The *Mourning for a dead moon* performance was my second time working with the plastic costume, which gave me varies inspirations every time. The first time I wore the PlasticDress (*kimosphere no. 5,* Queen Mary Drama and Film Theatre, 2017)[27] I imagined it as a tail, a part of my body. But in *Mourning for a dead moon*, the function of the PlasticDress changed because the character I embodied changed. I imagined I was a creature in the forest. The plastics were the 'vomit' from my stomach which I had swallowed for years in the contaminated environment I inhabited.

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[27] This dance was performed during the conference, 'Staging Atmospheres: Theatre and the Atmospheric Turn', Queen Mary University of London, 8-9 December 2017.

Fig. 35. Scene 3 of *Mourning for a dead moon*, Plastics dance, December 2019. © Photo: DAP-Lab.

The movement is formed from the process of spitting plastics out and entangling with them. I creep forward to the vomit from a dark area of the forest and carefully examine the pieces. I watch, smell and feel the temperature of the vomit and the gastric secretion that connects every piece of the plastic. I try to recognise what they are and why they are so hard and different from the plants which I eat every day in the forest. I touch them and try to sense them; they are soft and sharp at the same time. Why do these materials make my stomach uncomfortable? I creep through them; my limbs entangle with them; I lie on them and tried to jump out from them. I cannot escape from them as they have become a part of my body already. I bite the plastics using my mouth, creeping further, along a diagonal crossing from upstage right to downstage left, towards the moon light. I never get rid of them completely, and all the scenes are just in my imagination.

Fig. 36. Scene 3 of *Mourning for a dead moon,* Plastics dance, December 2019. © Photo: DAP-Lab.
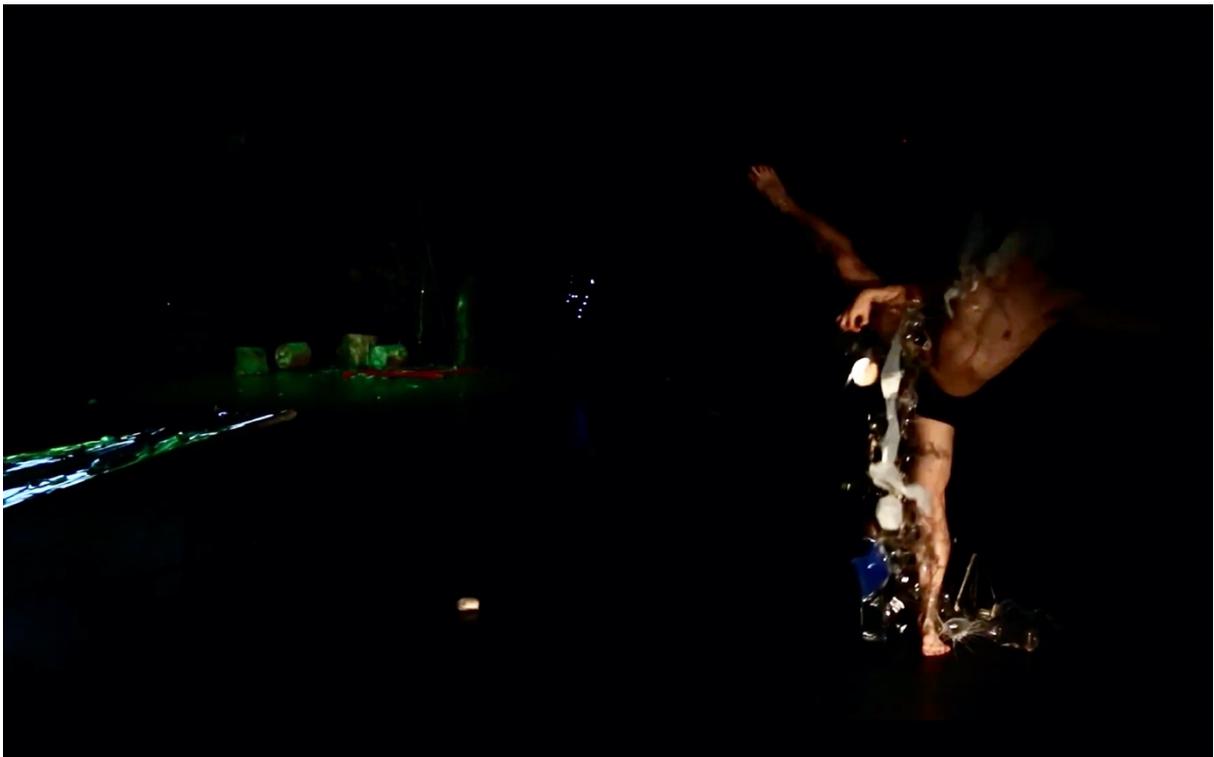
Fig. 37. Scene 3 of *Mourning for a dead moon*, Plastics dance, December 2019. © Photo: DAP-Lab.

In this experiment, I embody the imagination of how I intertwine with the plastics and how to represent the 'invisible plastics' in my body. The metaphor underlies my movement choreography.

4.4 Prosthetics

Gaoqiao, or 'stilt' in English, is one of the significant props in the Chinese folk dance *yangge*, examined in Chapter 1. In *Mourning for a dead moon*, I utilised *gaoqiao* as a body extension, as prostheses which were part of my legs. Rather than standing on *gaoqiao,* as it is traditionally done in *yangge*, I chose never to stand up, but lay down on the floor and found other, inverted possibilities with and for my extended legs. Wearing *gaoqiao*, I tried to reach further spaces through movements and explored how to move with limitations. To control the extended body, I needed to extend my sensori-motor consciousness to the end of the *gaoqiao* so that I felt the integration of the *gaoqiao* and my body. When my *gaoqiao* hit the ground, the sound brought another perception to me and generated the next movements.
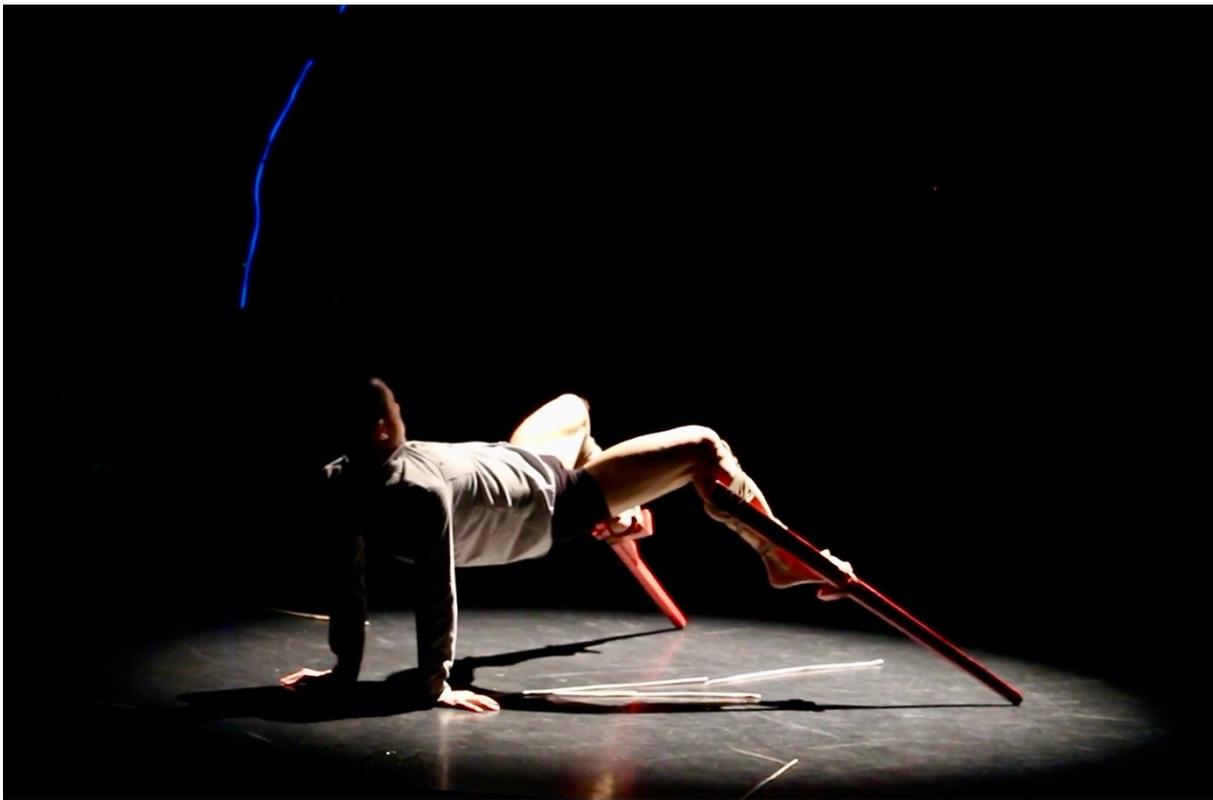
Fig. 38. *Gaoqiao* and prosthesis, performed in the Epilogue of *Mourning for a dead moon*, 2019. © Photo: DAP-Lab.

The potential of *gaoqiao* will be explored further (in the next chapter). How can *gaoqiao* be used as a choreographic object or device? In *Mourning for a dead moon*, in a final Epilogue scene when I perform the upside-down use of the stilts, Birringer suggested to slowly raise up

one additional stilt with a fishing wire upstage right, to echo the earlier rise of the moon on stage left. Thus, a single *gaoqiao* started to slowly float upwards and hung in the air, becoming another kinetic object within the larger setting. The connection between the suspended *gaoqiao* and the *gaoqiao* as my extended legs provided an uncanny dialogue. It was a dialogue that also seemed a culmination of all the phases of the rehearsals leading up to this performance, the suspension wires crossing the stage like a spider web and connecting objects and bodies in poetic ways, allowing for the imagination to travel, move and expand, almost as one can picture a highwire dance act.

In the third work I created for this research, titled *Unexpected Bodies*, I imagine combining *gaoqiao* and a vision system (GoPro Hero 8) together in order to catch the views from the end of my prostheses, the extended stilt legs. We already tested the GoPro camera in one of our many rehearsals leading up to *Mourning for a dead Moon.* Attaching the lens of camera to the tip of the stilts during dance composition, my legs will be my eyes. Furthermore, the sound and the images captured by the GoPro camera will operate through the software in real-time. In the next chapter I will examine how this cultural object (*gaoqiao*), in this manner spliced with a technological instrument, is affected or changed in contributing to the process of techno-choreography.

4.5 Summary

The working method for *Mourning for a dead moon* was different from my previous choreographic experiences. DAP-Lab is a company where every artist is independent but nevertheless works in a collective manner with all others. Members bring their ideas to rehearsals, then improvise and create together. Everyone has freedom to expand their ideas. *Mourning for a dead moon* was created through continuous stimulation between each participant. This kind of working method is addictive. During the cooperation with Danjoux, I experienced how costumes inspire and affect a dancing body and how a dancing body embeds body memories into wearables. There is no hierarchy between garment and body, but they work together to trigger possibilities in a shared digital environment. Danjoux's costume design has multi-functions which stimulate the possibilities of creating movement.

I experienced *Mourning for a dead moon* as an intercultural dialogue. First, the intercultural dialogue happened inside my dancing body. In Taiwo's monograph, he claims,

> When we examine and define ourselves as multiple coexistent identities, contradictions occur in the ontological framework of our consciousness. Rather than seeing our existence as 'definitive', it becomes 'relative' as the witness that presides and observes the changes in phenomena around us becomes able to hold two opposing points of view at the same time. (2021: 86-87)

Wearing *gaoqiao*, CryptogamicLightCape and moving with plastics were the experiences of dealing with 'multiple coexistent identities' in *Mourning for a dead moon*. The body memories of Chinese classical dance, *yangge* folk dance and contemporary dance techniques were integrated through my dancing body.

Second, the intercultural atmospheres were created through scenography, interactive design and performers in *Mourning for a dead moon*. Birringer's avant-garde scenography utilised *gaoqiao*, the ancient Chinese folk dance props, as an installation object, along the lines of the experimentations which we did with suspended objects in *Whisper Room* and *Some Day*, where the suspensions enabled me to manipulate and respond to the sound affected by the materials, as well as working with the hanging microphone, my voice and the MiniBee sensors on my wrists. We used paper, plastics and gels, and in the scenography of *Mourning for a dead moon* we also used real tree trunks of fir and pine trees, branches, leaves, mulch and mushrooms to indicate the organic entanglements of a forest landscape, to elicit memories through smell, colours and textures. All these interactions could create changes in the output dispersion (sonic, lighting, video) as well as feed back to my movement kinesthetics. In one scene I did nothing but 'planting' – I slowly moved the trunks around to pile them up, and I erected a tree branch, inside a microphone stand. In addition, my behaviour of moving tree trunks on the upstage right side connected to Birringer's stand-up comedian monologue on the front of the stage, during Scene 5. He addresses the climate crises through a series of vignettes, and in one of them he narrates a story from his childhood, and I felt that I was the child in his monologue. Then, when I sat on the floor wearing *gaoqiao*, the silent behaviour also contrasted with his actions, such as jumps and a handstand he performs at the back of the stage. We perform in separate spaces, but we are connected closely to form an intercultural dialogue on the stage, accentuated also by the use of different languages (Birringer speaks

German, English, and French and references Greek and Japanese concepts from science and ritual, and also mentions that our *Moon* performance is preparing to tour China).

My body trained in Chinese classical dance helped me interact with the wearables designed by Danjoux, a British-Mauritian fashion designer. I used Chinese classical dance movements in working with the CryptogamicLightCape, which evoked surrealist images of animated light, and included a subliminal reference to Georges Bataille's *Acéphale*, a headless figure reflecting visions of a nocturnal ritual or sacred conspiracy. The garment alerted me to think about Chinese classical dance techniques with the techno-design artefact of wearables, phrasing and rephrasing the seeming incompatibles, gently interweaving them. The CryptogamicLightCape was quite heavy, so my movements were based on *dantian*, the concept applied both in Chinese classical dance and *tai chi*, imaging from an inner world, connecting with the garment. Using *yuanchang*, 'circling the stage in brisk heel-toe walks' (Wilcox 2018: 148), flowing in the dark and *yuanchang* helped me to move with the garment smoothly, also involving Chinese aesthetics into the movement design. I used *wuhua*, gestures from Chinese classical dance to move through plastics which I imagined as vomitus spitting out of my stomach. My trained dancing body integrated with Danjoux's design, and our intercultural dialogue was embodied through the hybrid production of *Mourning for a dead moon*.

Chapter 5. *Unexpected Bodies*

The title of the third creation, *Unexpected Bodies,* signals that the embodiments of dancing bodies under techno-choreography are not predictable. While they cannot be anticipated, the choreographic research promises a heightened sensitivity of dancing bodies in unstable digital environments, so that unpredictable scenarios can yield unexpected gains. *Unexpected Bodies* also entails further evolutions, marking the fact how my dancing body changed over the past three years of working on my doctoral research with new technologies and intercultural environments. I am slowly becoming other.

After three years of the research with creations and writings, I now offer a critical reflection on the last of my practical experiments, *Unexpected Bodies*. All of the three creations in this research focus on techno-choreography and the embodiments of Chineseness, but they each have different emphases during my artistic and intellectual journey. In *X-Body* (2018), the first practice work lasting forty minutes, I paid more attention to the codified movements, and the training backgrounds of the dancers involved. For instance, Wang had a training background in *xiqu,* Chinese classical dance and contemporary dance, Zhou in Chinese ethnic and folk dance, Li in choreography and Zhu in ballet. I choreographed movements on my own body, and then taught them to the dancers in the ensemble for this first work (I was myself also one of the dancers). It was meaningful to observe how they performed with subtle differences, and I adjusted movement structures according to the embodiments of the dancers equipped with different training genres.

Although all of them had backgrounds in Chinese dance, their dancing styles varied. With *Mourning for a dead moon* (2019), the second creation for my research collaborating with DAP-Lab, I focused on body memories when I dealt with digital scenography directed by Birringer and wearable technology designed by Danjoux. The techniques of Chinese dance I had been trained in helped me engage with the interdisciplinary creation, and bring to the performance and the designs my personal expressive and interpretive qualities, while also affecting the evolution and the movement vision for the work as a whole. The last work, *Unexpected Bodies* (2020), is a solo work. In this dance I explore how cultural objects and the awareness of cultural identity contribute to the process of techno-choreography and how technology affects the embodiment of Chineseness.

For *Unexpected Bodies*, I did not spend a lot of time on movement composition, but concentrated instead on software programming, patch construction, learning about virtual reality, solving computational bugs, and mapping. Partly, this was also enabled or imposed by the outbreak of the Covid-19 pandemic, leading to lockdown restrictions in the UK in March 2020. Throughout the summer of 2020, I followed the Isadora Guru Session delivered by Mark Coniglio (the composer and software artist who had written this software) to improve my coding ability and my sensitivities working with a computational process, and a data environment that was co-present with a physical theatre or studio environment. These skills require significant time to master. It takes time for a choreographer to understand coding language, which is essential in the study of the intersections between dance and technology.

As per my initial conception, *Unexpected Bodies* was going to be a work process collaborating with a digital designer along with five or six dancers of different cultures. Due to the Covid-19 pandemic, Brunel University's research protocol did not allow participants to attend live rehearsals during the first term of 2020. To complete this research, I therefore had to re-adjust my experimental plans. In the end, I choreographed, performed, designed and programmed *Unexpected Bodies*, all by myself, thus taking control of the entire digital, technical and performative production of the new work. This outcome was, indeed, unexpected, in my mind, and it raised many new questions that I tried to answer during the research process for the creation. *Unexpected Bodies* premiered and was filmed at Artaud Theatre Brunel University London at 8 pm on the 9th of December 2020. Because of Covid-19, there was no audience. It lasted around forty minutes, and included five scenes: 'Preface', 'Curving', 'Extending', 'Flowing' and 'Fusing'.

5.1 Cultural Objects and Techno-Choreography

I open with an image of a stage entry: entering the space from upstage right, I slowly cross over to downstage left, carrying with me the *gaoqiao* (stilts), a traditional cultural object of *yangge*. I carry them on my shoulders, and in one of my hands I also carry Oculus Quest 2, the latest version of a virtual reality (VR) headset. Symbolically, my entrance is to evoke my passage, coming from China to the UK. I have transitioned. I put down the VR headset, sit on the ground and begin to bind the *gaoqiao* to my legs. During the binding, countless memories related to *gaoqiao* flicker through my mind. Binding *gaoqiao* is a time-consuming task; the

gaoqiao must be fastened so that they will not fall off during movements. But they should not be so tight as to affect circulation in the legs, and dancers cannot move if they cause pain. I work slowly and methodically, manifesting the careful labour of binding *gaoqiao* on the stage, so that viewers can reach their own understanding about the cultural object and how it is attached to the body.

Fig. 39. Entering with *gaoqiao* and Oculus Quest 2, VR headset, Zhi Xu, December 2020. © Photo: Eve Gabarre.

Fig. 40. Binding *gaoqiao*, opening scene of *Unexpected Bodies*, by Zhi Xu, December 2020. © Photo: Yifan Li.

In the scene titled 'Extending', I focus my research experimentation on the influence of cultural objects on techno-choreography. In other words, I deliberately splice, so to speak, the traditional objects/props and costume elements of Chinese dance with technological parameters and programming 'actors' or 'objects' as they are known in computational software patch environments such as Isadora or Max/MSP. I found that exploring histories of cultural objects and seeing them as 'actors' helps the process of creation. *Gaoqiao* represents a significant cultural symbol. It is a kind of limitation: when people wear them, they need to find balance to walk. It requires training to walk flexibly. When people wear specifically designed costumes to hide the *gaoqiao*, their appearance becomes captivating. In my research, I did not intend to re-construct 'digital *yangge*', but I intended to investigate the contribution of *gaoqiao* to contemporary choreography and digital scenography.

Due to the limitations and the extension of *gaoqiao*, the length of the *gaoqiao* must be considered in designing movements. To avoid injury to my legs, I keep the length of *gaoqiao* in mind and create with that limitation. Gradually, I become fascinated by this restriction. If there were no *gaoqiao*, I would not have created some 'unusual' movement trajectories. When I put on *gaoqiao*, my movement design naturally takes feasibility into consideration.

Fig. 41. Extended limbs through *gaoqiao* by Zhi Xu, *Unexpected Bodies*, December 2020. © Photo: Johannes Birringer.

Along with *gaoqiao*, the handkerchief is another cultural object in *yangge*, especially in *Dongbei yangge* (or Northeastern Han folk dance). The design of the handkerchief symbolises farmers' harvest, and the combination of the red and gold colours presents the aesthetics of the region. There is an iron ring in the centre of the handkerchief so that it can be quickly spun in performance. In 'Extending', I not only spin it but explore other sides and dimensions of the handkerchief. I thought about what this cultural object means to me. It is an object that evokes memories of seasonal festivals in my hometown. It evokes memories of people's smiles when they dance during festivals. Through it, I am thinking of the dialect of my hometown. During festivals in Yanji, the name of my hometown, people dance with handkerchiefs, colourful fans and silks with the accompaniment of folk instruments, such as drum, gong and cymbal. *Dongbei yangge* has evolved into an entertainment for ordinary people. I explored it with my memories and queries: How can these cultural objects work live on camera? What can they bring to digital performance? Can they become an instrument?

Fig. 42. Exploring handkerchief, in *Unexpected Bodies* by Zhi Xu, December 2020. © Photo: Yifan Li.

I explore the concept of digital performance and use the software Final Cut Pro to generate characters, projecting them during my movements. I also explore the webcam interacting with a handkerchief and *gaoqiao* during the experimentation to determine if I might find ways how to embody them in the digital. It was fascinating to me when a handkerchief and *gaoqiao* came to be present in motion on the screen, captured through the webcam, but considering the structure of the whole work, this method is also repeated in the next scene, 'Flowing'. I decided to create a parallel performing space, i.e. I translated the objects I used in 'Extending' to re-invoke their presence with Chinese and English characters through graphic projections, and I interacted with the real objects in the theatre space.

Chopsticks are explored as a sonic instrument in *X-Body*, but this time, in *Unexpected Bodies*, chopsticks bring also religious metaphors and resonances along with the digital design of live projecting. *Kau chim*, also known as lottery poetry, is a fortune telling practice that originated in China and is rather popular in the south of China, for example the Fujian and Guangdong provinces. People go to a temple to pray and ask about the future. There are numerous sticks in a barrel; after shaking them for a while, one needs to wait for one stick with carved numbers to jump out to the floor. A master in the temple must explain the meaning of your stick. In 'Extending', I hold a bundle of chopsticks facing the characters projected on the screen, then drop the chopsticks gradually onto the floor. One could find a connection between this movement design and the process of *kau chim*.
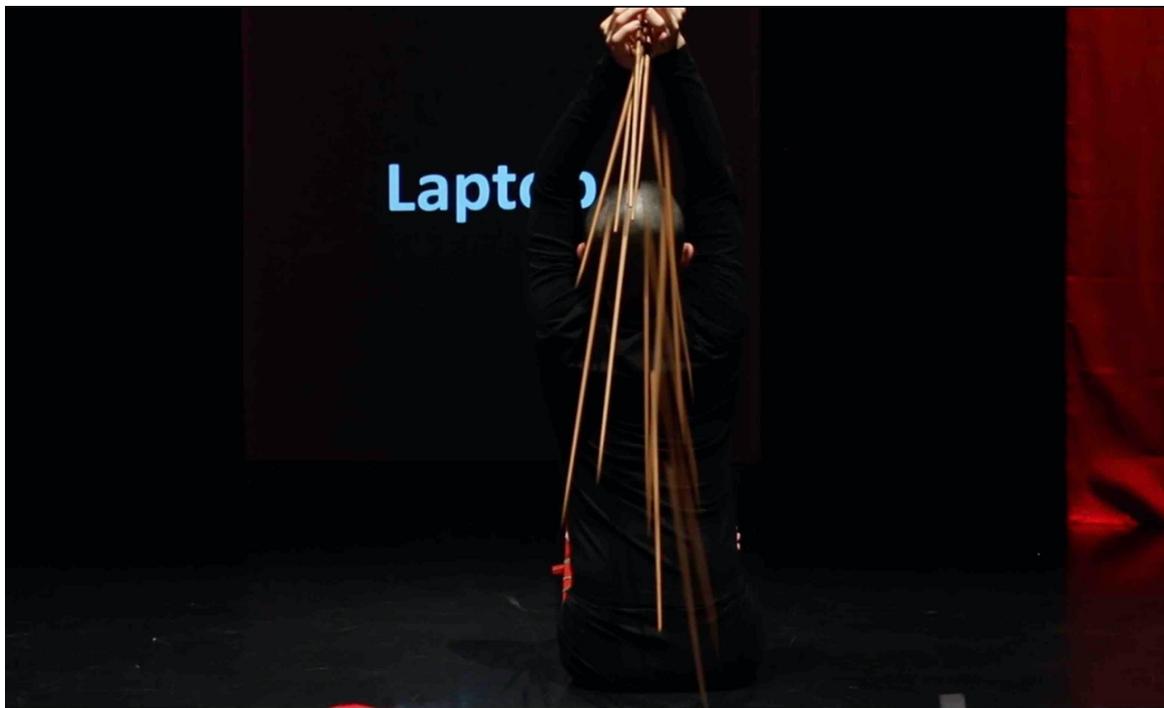
Fig. 43. Using chopsticks as a metaphor of *kau chim*, in *Unexpected Bodies* by Zhi Xu, December 2020. Video still: Eve Gabarre.

5.2 Real-Time Interaction as Choreography

Real-time interaction is a significant factor in techno-choreography. In *X-Body*, I manipulate software patches on the backstage where the audience cannot see what I am doing. In *Unexpected Bodies*, I choose a very different approach, making the technical software operations transparent. I complete a live drawing using the software Isadora, along with a webcam. The process of live drawing is presented on the stage. The audience can see me

sitting on stage working with the keyboard and touchpad of my laptop, and they can also see the 'computerised me' through projection at the same time. I also can observe the process through the monitoring window on the computer and adjust the processed images of myself. I adjust what I can, or imagine being able to, adjust. It also occurs to me that the software with its intelligent algorithms makes the output hover between the determined (parameters) and the processually randomized functions of specific computational actors whose agencies might be beyond my grasp.

Is such live drawing a kind of choreography? I strongly argue that it is, yes. Although live drawing is presented through graphics or digital lines, the audience might see the performer sitting on the stage quietly, except for hands moving on the pad of a laptop. The hands moving or the gesture is the embodiment of techno-choreography. The speed, the pause and the routine of the hands are a kind of emotional expression.
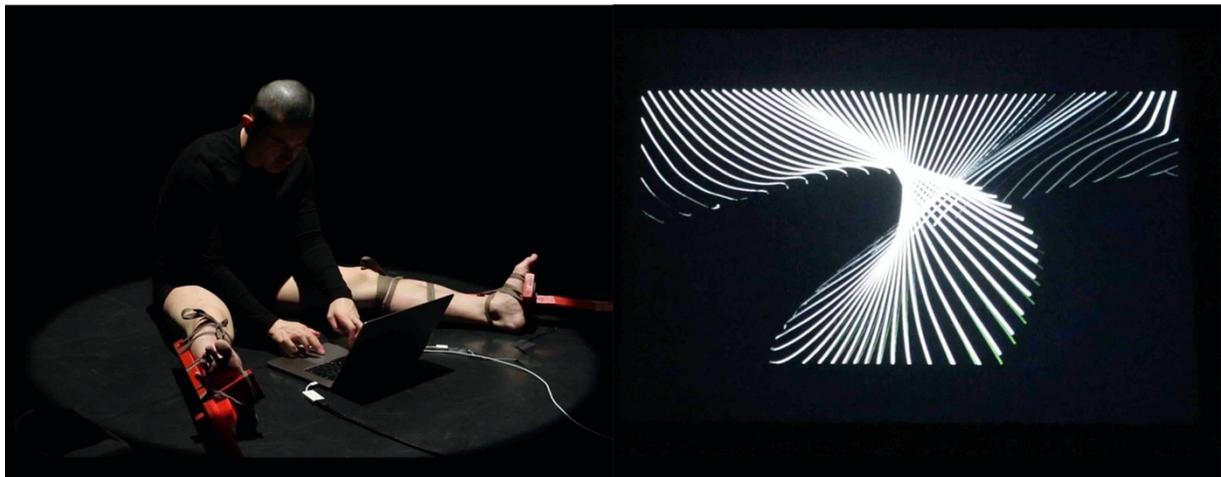
Fig. 44. Live drawing and manipulating by Zhi Xu, December 2020. Photo: Eve Gabarre and Zhi Xu.

Interaction with the camera is an addictive, creative experience, especially when generating real-time visual effects. As the dancer and the choreographer can see the effects in real time while/after programming, the process of dialogue with the digital provides numerous choreographic potentials. I recorded the rehearsal process and then studied the footage later to choose what kind of choreography I would keep in the real-time creation. Many times, I picked up the motifs from the recordings, then developed them the next day. The camera captures and magnifies the details of the body and movements, which were easily ignored in the theatre. These detailed movements and 'graphic' motions (lines, shapes) are always very

difficult to choreograph. This kind of emergent digital embodiment is not possible in traditional choreography.

There is another example about capturing details. During my meetings with Birringer in the summer of 2020, he shared with me an artistic work about refugees escaping abroad on a boat, trying to cross the Mediterranean. [28] The video artist wore a camera on her wrist to record the journey. This touching work suffocated me when I saw the footage of her sinking into the sea, the fear and inability to breathe, the helplessness. One detail from this footage impressed me deeply. It was an insect crawling peacefully over the camera. I felt the insignificance of human life, overshadowed by the animal world and nature. I also saw the comparison there between the struggling artist under the sea and the insect passing. The camera can capture scenes that the naked eyes ignore, which could be the moment in a work that will inadvertently touch the viewer and be remembered.

In the process of dancing with a live webcam, I also discovered its drawbacks. In such an interactive situation, when I can monitor myself at the same time, I pay most attention to what the camera captures, how I am framed in movement, what angles the camera vision allows for my body's presence in capture. My attention is split between the camera capture and the projection. Therefore, my sense of my body in the physical space and the feeling of my body itself are reduced. Real-time interaction is different from still images. A dancer needs to pay attention to what is being, what has been, captured, whether the interaction works or not, whether the frame capture is as intended or not, and whether there is a light source on the body in those moments when parts of the body (hands, fingers, face, head) are to be captured only. There are unstable factors always, and the choreographer cannot predict what might happen during the performance.

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[28] The film *Das Purpurmeer* [Purple Sea] was made by Syrian artist Amel Alzakout, documenting her flight across the Mediterranean, her boat sinking off the coast of Lesbos. It was shown on ARTE channel in Germany and France in July 2020.
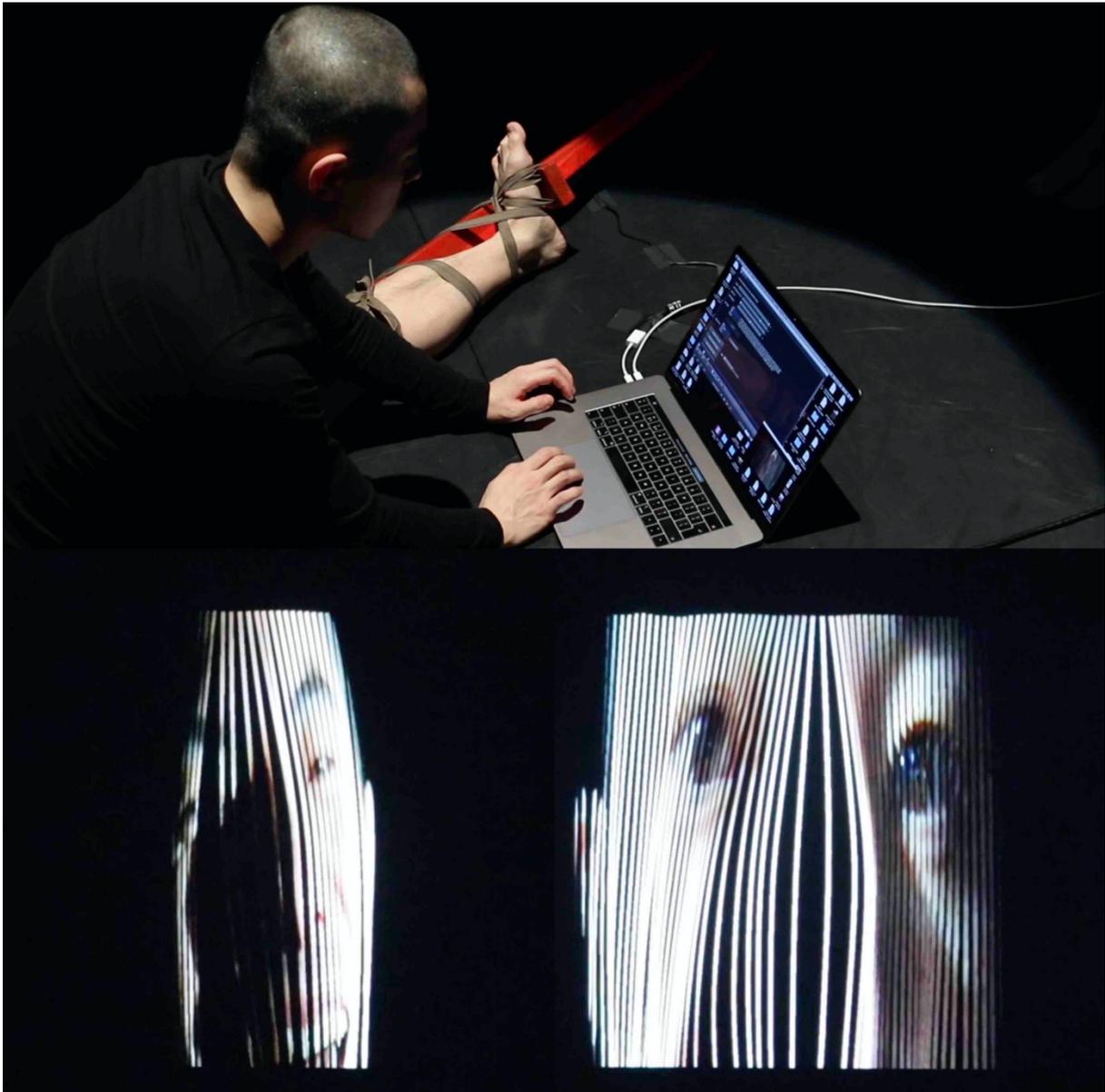
Fig. 45. Live webcam and Isadora programming by Zhi Xu, December 2020. © Photo and video still: Johannes Birringer and Zhi Xu.

5.3 Mapping

Mapping is a vital technique in techno-choreography. IzzyMap reduces the time needed for mapping. Mapping helps construct an immersive digital space through high-resolution projectors, for example, in the dance installations *metakimospheres* (2014-17) created by Birringer, Danjoux and the DAP-Lab, or the digital religious dance *Neo-Kut* by Haein Song. In the creation of *Unexpected Bodies*, I utilise mapping techniques on a mannequin. Because of the special shape of the mannequin, it takes a long time to adjust the mapping to achieve an

ideal fit. Through IzzyMap, multiple shapes can be superimposed and combined. After several days working on it, I completed the mapping on the mannequin with a satisfying visual result.

Fig. 46. Mapping through IzzyMap by Zhi Xu, December 2020. © Photo: Zhi Xu.

For mapping techniques, it is important to keep the same distance between the projector and the projecting surface every time, otherwise the mapping can fail. In my experimentation, I use marks on the floor to ensure the same positions of the mannequin and the projector. The mapping technique utilised in *Unexpected Bodies* differs from the metaphoric mapping in Song's creation. 'Metaphoric mapping is a spatial design method offering an iconographical and sensual environment to increase the involvement of guests and *shimbangs*' (Song 2019:

91). Applying metaphoric mapping, Song constructed an immersive environment for participants to perceive the digitalized traditional shamanic *kut*. Mapping techniques applied in *Unexpected Bodies* built up a figure. Through mapping on this mannequin, I constructed a 'duet' between me and the other. It is a precise mapping technique.

Mapping techniques provide potential for abstract visual effects. For example, in *Mourning for a dead moon*, Birringer created speaking mouths (my mouth and Michèle's mouth) on the 'moon', a white Styrofoam sphere. During my experiments, I tested the mapping of faces (from different periods of my portraits) on the mannequin. The structure of *Unexpected Bodies* developed from these tests based on mapping techniques. Mapping is a technique to project precise images or videos onto a specific object or roll out a predesigned atmosphere in performance making. The challenge for a choreographer is learning the software mapping tools. For example, IzzyMap is an efficient feature based on Isadora. However, a choreographer needs to first understand how to use Isadora, and then to explore the functions of IzzyMap. In my experience, this learning process was time consuming and could be frustrating.

5.4 Motion Tracking

Current research on motion tracking mainly focuses on movements. However, I am curious about how to embody cultural objects in motion tracking and how cultural objects affect the process of motion tracking. In the scene 'Flowing', I explore two different kinds of fans that are used in my native country. The fan is a significant prop in Chinese dance both of Chinese classical dance and Chinese ethnic and folk dance. There are countless dance works with fans. I claim that the Chinese dance-fan embodies Chinese aesthetics and triggers body memories in techno-choreography, like the chopsticks, *gaoqiao* and handkerchief I have used in my research practice.

I found two results in these explorations. First, using a fan with motion tracking, a techno-choreographic method, the physical skills and aesthetics I trained with Chinese classical dance-fan were evoked. It is not difficult to find the aesthetics of Chinese dance, such as *liu bai* (leaving space for imagination) and *shenyun* (body rhythm). Since I trained in Chinese dance for years, even though I paid attention to the interface of motion tracking, my dancing

body moved in the way of *shenyun*. If one has the background of Chinese dance, it is not difficult to recognise the genre of my movements in this piece. Second, I was 'wearing' culture: because of the symbolic value of the fan in Chinese dance, in the research process, wearing the fan on my body stimulated inner emotion. It is a quiet feeling: moving slowly, leading by breath, I begin sensing the integration of the fan and my dancing body.

Fig. 47. Exploring fans and wearing culture, in *Unexpected Bodies* by Zhi Xu, December 2020. Video stills: Johannes Birringer and Eve Gabarre.

The equipment I use in this scene are Logitech C920 webcam, Isadora Eyes++ and an EPSON EB-X03 projector. Logitech C920 has high sensitivity, providing full HD 1080p at 30fps video with stereo audio, and HD auto light correction. The webcam provides security to capture the dancer in the relatively dark environment of the theatre.

In the motion tracking used in *X-Body*, I focused on the relationship of Jiajie Zhou's movements and the interface. In *Unexpected Bodies*, however, significant time is spent during the preparation to explore the embodiment of fans with motion tracking, as well as the engagement between my dancing body, the fan and the Eyes++. Studies have demonstrated that when fans are involved in live tracking, adjusting the volume of the threshold is significant. Because sizes of the fans are different from the dancing body, correct volume number promises capture accuracy. The volume number is 80 in 'Flowing', which provides the best visual effects and clarity of movements. In addition, a common knowledge is that the motion tracking also has colour requirements. In 'Flowing', when using Eyes++, the tracking objects have to be light coloured; white provides ideal outcomes. The fans' design includes a large proportion of white, and there are no issues tracking the two fans in this experiment.
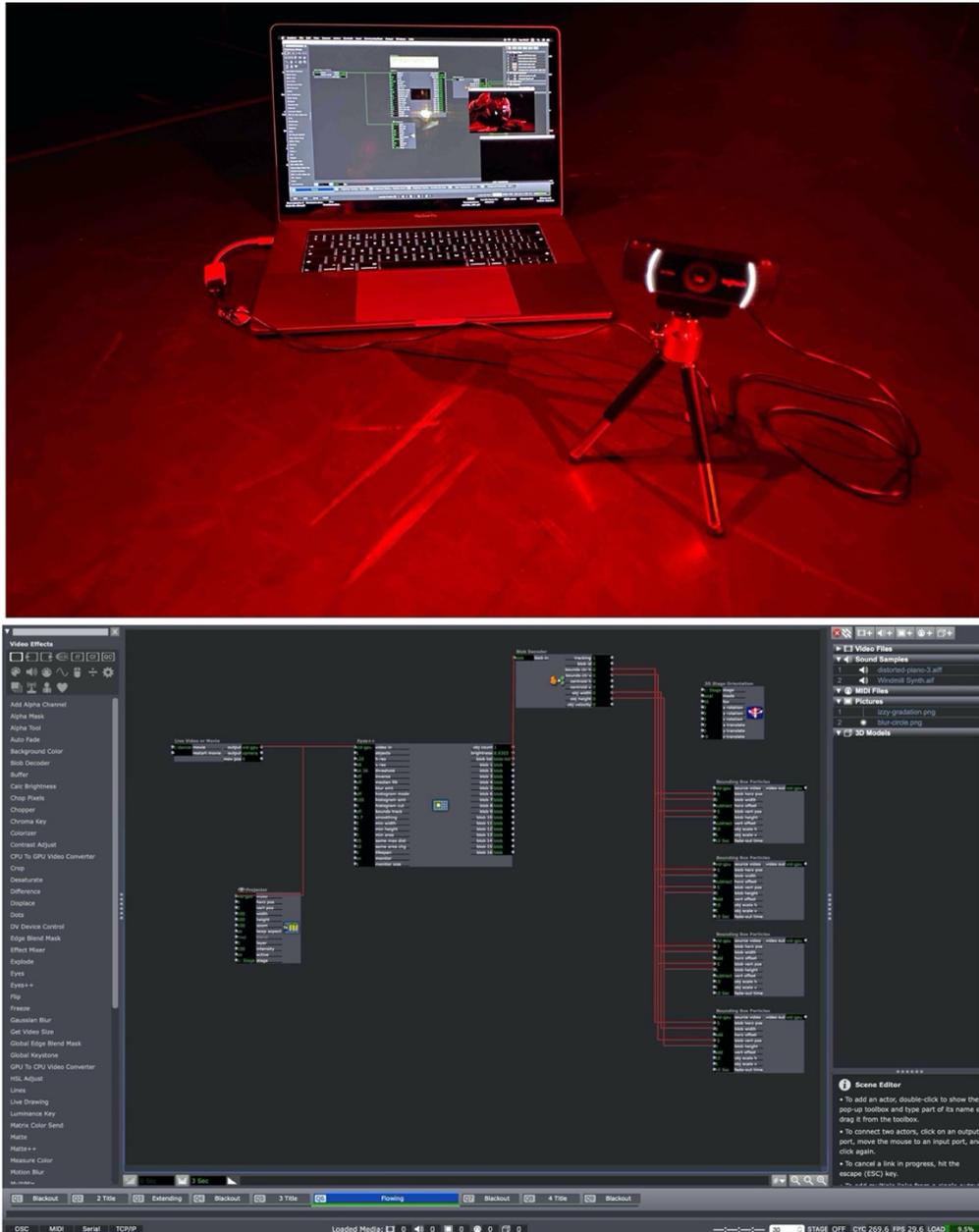
Fig. 48. Isadora programming and webcam test, November 2020. Photo: Zhi Xu.

The intention of using fans in this work was to explore the idea of choreographing fans as digital and wearable culture. Fans are popular props in Chinese dance. In *Unexpected Bodies*, I was not only holding a fan in the movements, but also wearing it in my choreography. In live motion tracking through a web-camera, the visual effects caused by fans triggered my movements. Digital pixels generated by the fan based on the motion tracking actor Eyes++ provided ideas for choreography. For example, chasing digital pixels through my dancing body was the process of creating movement consequences from the fan. Avoiding digital pixels caused by the fan through my dancing body generated flowing floor movements,

standing and jumping. The idea of wearing culture was inspired during rehearsals. I found that the actor Eyes++ expanded the shape and the volume of the fan through projection. Putting the fan on my head inspired movements focusing on joints, ankles and fingers. These parts of my body gained my attention when I moved. Through the web-camera, I noticed that the material quality of the fan was enlarged, and I had other angles from which to observe this cultural object. I have used fans for many years in choreography, but had not previously envisaged how their qualities could be played with in techno-choreography.

5.5 Virtual Reality and Techno-Choreography

During the experimentation for *Unexpected Bodies*, I spent months studying and practicing virtual reality (VR). The latest VR headset, Oculus Quest 2, was released in October 2020, and it was less expensive than others, like HTC VIVE or Sony PlayStation VR. More importantly, it is wireless and much lighter than previous products. It is a gift for the study of dance technology, since it can easily be worn during movement. What I explore in 'Fusing', the scene using Oculus Quest 2, is the generation of movements through VR and drawing red silks in VR. I was also keen to know what the contributions and drawbacks of VR to dance technology could be.

Before addressing my findings, I would like to introduce the first impression of working with Oculus Quest 2. This display is all-in-one; no additional headphones are required. The resolution of 1832 x 1920 pixels per eye provides a stunning immersive experience along with the three-dimensional sound. I can move freely and do not need to worry about the cables anymore. The app First Steps taught me how to interact and navigate in VR. Through two controllers, I had to manually put a cassette into the game console, practicing with games to become familiar with VR. I danced with a robot in the application called First Step – we held hands moving, spinning, learning a variety of steps. This interactive design stimulated my body to move naturally. The design of the introduction was user friendly. Although I had many VR experiences before trying this equipment, the interactive immersive environment still grabbed all my attention, and I was positively shocked by the development of VR equipment. As a researcher in dance technology, I see the close connection between the development of technological products and the progress of dance technology. It is necessary

to keep a close eye on the latest hardware and to consider them from the perspective of dance workers.

Fig. 49. Immersive experience and dancing with a robot in VR, November 2020. Video still: Zhi Xu and Oculus.

Dancing in virtual space through creative tools contributes to movement generation. But there are also issues. When creating in virtual space, James Else claims that:

> In analysing VR for the movement-based artist, it is impossible to avoid being drawn into considering the relationship between those involved in generating and those experiencing these new artworks. Since only facsimiles of physical bodies

can occupy the virtual space, a completely connected experience becomes impossible. Consequently, not only can the performer and audience member no longer occupy the same physical space, no one involved in the work can even have a cohesive sensory experience with themselves. (2018: 47)

In choreography, collaborations between dancers are significant. Exploring movement sequences as group work allow dancers to explore movement motifs together. But in VR, the cohesive experience for a group dancer is difficult. Dancers immersed in the same virtual space cannot repeat each other's movements precisely. Physical sensations present another challenge. Physical sensation in movement is very significant for dancers. In Katan-Schmid's experimentation, she points out,

> At the outset, moving in VR technology interrupts the dancers' somatic awareness. While dancing dancers tend to integrate attentiveness to their bodily feelings in order to complete their movements. Staging dancers in VR is a challenge for their artistic perception since the VR setting converts the experience of how dancers normally lead their dance. While moving within a virtual environment there is a disruption and discontinuity between what the dancers see and how they feel their bodies. Thus, at first, it might seem that VR technology throws embodied thinkers into a dualist – Cartesian – state of mind, in which visions, actions, and thoughts are disconnected from the sensual body. (2020: 227)

Based on Else and Katan-Schmid's experiments, I explored movement generations and creating red silks, the props of *yangge* in VR to query the embodiment of Chineseness. Tilt Brush, a painting application working in three-dimensional virtual space, contributes to the research of techno-choreography. This application is popular among artists from movement-based artists to painting-based artists. Else and Katan-Schmid's experiments also utilised this tool.

Through Tilt Brush, I have explored two methods using VR to create dance. The first is writing through body, writing Chinese characters in a virtual world through two controllers leading my dancing body to move. It was not easy to write the characters directly, but I considered the connections between my limbs, head, back and shoulders. I saw what I wrote in VR and how the virtual space was occupied. The virtual space was slowly filled with the characters I created, and I had to avoid them to find empty areas to continue. When I studied the rehearsal footage of working with VR, I found the movements had been created logically, and some movement sequences were impossible to choreograph without the intervention of

the VR headset. This method has potential to be utilised in the bachelor programme for the disciplines of dance, theatre and performance making. Students can learn how to generate movements through VR, and their improvising capacities will be improved and intensified through playing/performing with VR.

Second, the method of drawing red silk in VR has been explored. There are four long pieces of red silk hanging from the ceiling to the floor in the theatre, in the stage design for *Unexpected Bodies*. I designed them to separate the physical space where I performed. I then brought this idea into VR. I drew different sizes of silks, then changed their proportions, re-constructing the virtual space. My dancing body needed to squeeze through a small circle or lie down to find a moving space. The whole process was projected live to audience members, so they could see the relationships between my movements and the virtual space, which was gradually constructed along with the choreography.

Writing through body in VR is a method I explored in this scene. The movement vocabularies were generated via writing Chinese characters in a virtual space through Tilt Brush. Painting red silks using Tilt Brush provided a visual record of how the props of *yangge* can be present in the virtual world. For example, in traditional *yangge* red silks as props express the emotion of joyfulness and celebration. But in VR, the cultural symbol exists as a changeable, transformable one. When I use the two controllers to magnify one piece of red silk five times, it turns into a giant red wall in front of me. When I use the controllers to shrink the red silk several times, it becomes a red chopstick, a fine red string – potentially fading and vanishing in the vast virtual world. In one rehearsal, after I had drawn the red silks and left them hovering in the virtual space, I left the stage and looked back, and the red silks had turned blue.

In *Unexpected Bodies*, my dancing body was entwined with abstract silks, and finding spaces between these objects in VR generated my movements in a real theatre space. The virtual world I experienced was projected onto a screen so observers could watch the entire process. I argue that writing through body in VR provides values in terms of the practice of movement development for dance and theatre students. Through two touch controllers, practitioners can easily change what kind of tools they can use to build a virtual world. Writing characters, drawing objects, painting colours and building environments in VR improve the skills of improvisation and choreography.

Fig. 50. Writing Chinese characters through the dancing body in VR by Zhi Xu, November 2020. © Photo: Zhi Xu.
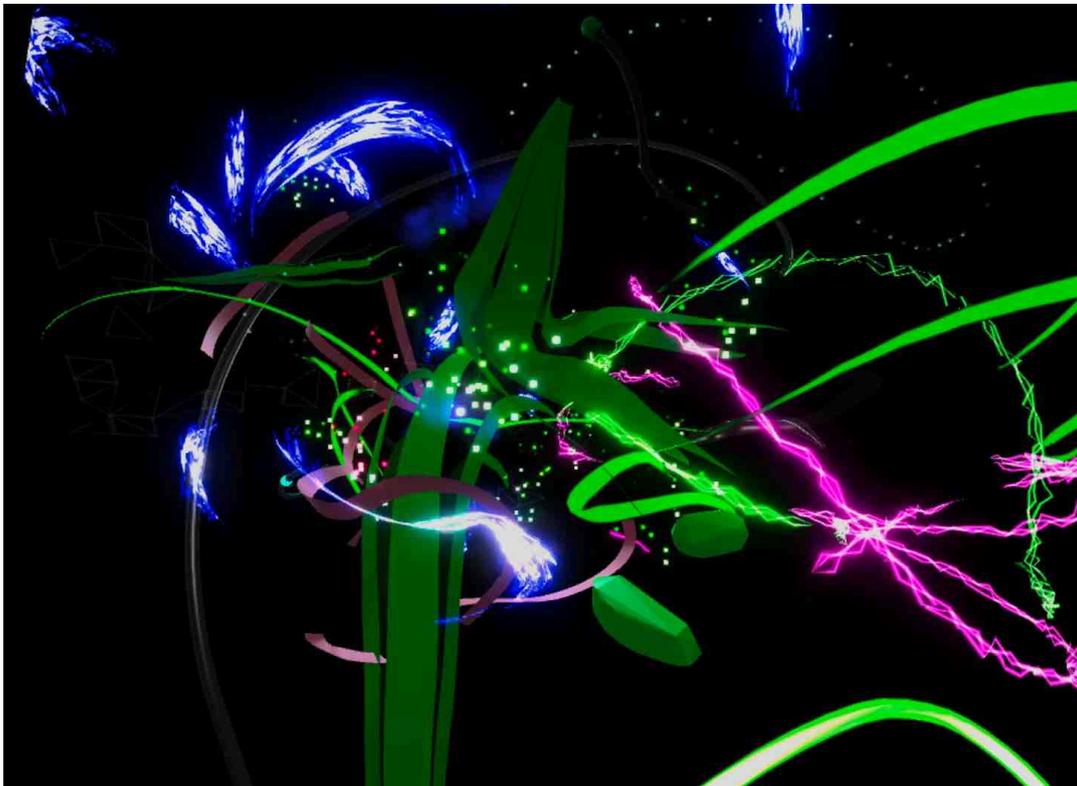

Fig. 51. Traces generated by Zhi Xu's movements in VR, November 2020. © Photo: Zhi Xu.

There were challenges in using VR in choreography. The first challenge I met was having a VR ready PC. At present, the Windows system is the most friendly to VR, while the Apple OS system does not support VR well. I spent days trying to connect Oculus Quest 2 to my MacBook Pro 2018, but my powerful laptop still could not meet the requirements of the central processing unit and the graphics processing unit. Ideally, PCs equipped with NVIDIA or AMD graphics cards function well with VR play. Secondly, it takes months to create a VR work for exhibition. During the experiment, I asked Ziwei Wu, a VR designer and a PhD at Hong Kong University of Science and Technology, to collaborate on a VR dance. We had several meetings to discuss the theme and ideas. It is impossible to complete this kind of project in a short time, as painting, 3D modelling, pre-rendering and real-time rendering require enormous time and effort. For this kind of cooperation, choreographic rehearsals and VR creation, we would have had to work together closely over a lengthy period. Due to the Covid-19 pandemic and the restrictions in London in 2020, it was impossible for us to work together. Thirdly, if Wu created a VR work, I would have to wear the Quest 2 with a cable, which needs to connect to a PC. This means I cannot move wirelessly, and live interaction in VR cannot be promised. After careful consideration, I decided to use Tilt Brush in this creation as choreographing through VR and live interaction were significant points in *Unexpected Bodies.*

Lastly, using VR in choreography requires a fast and stable internet connection. My university does not allow Oculus Quest 2 to use on-campus Wi-Fi. Contacting the IT department did not solve the issue. After searching for solutions online, I connected the VR headset to my mobile phone's personal hotspot. My laptop also connected to the personal hotspot so that the virtual space I constructed could be projected live to the public. These four challenges took a month to solve during the creation of *Unexpected Bodies*. Working with VR in choreography requires patience for a dance practitioner who does not have deep knowledge of computer science or game design. However, the VR learning process broadened my choreographic ideas, and in the end it yielded a range of conceptual and kinaesthetic provocations that I believe have been tested and implemented throughout the five-part structure of this last practice-based research production. From the moment of my transit/arrival into the kimosphere of *Unexpected Bodies,* carrying my *gaoqiao*, laptop and Oculus, through to the final vanishing moments of the 'characters' and red silk, as they slowly fade away after I have

left the stage, there is a process of many subtle transformations at work. And as you can see in Fig. 52, the colour of the red silks indeed also changed.

Fig. 52. Exploring Oculus Quest 2 in *Unexpected Bodies* by Zhi Xu, December 2020. © Photo: Graeme Shaw and Yifan Li.

Chapter 6. Conclusion

As I approach the end of this practice-based study I would like to reflect on the journey of this research and its quest to examine how cultural identity, i.e. the embodiment of Chineseness impacts and transforms technology-driven choreography. I have completed three full-length dance works in addition to this thesis in order to explore my research questions. The research questions ask how Chineseness contributes to the process of techno-choreography, how technology affects the embodiment of Chineseness and what Chineseness is in the context of techno-choreography. Completing this doctoral research in the UK has been vital as my intercultural experiences have allowed me to reflect on my identity as a choreographer, trained in Chinese dance and living abroad for a number of years.

My awareness of cultural identity has increased since the day I arrived in London in 2016. I was regularly asked the question, 'where are you from?' London is a city with people from many different cultures. The colour of my skin and my accent when I speak English reflects how people perceive my identity. The question 'who am I?' recurred in my daily life and choreography. Conducting this research in London has been a key part of the process in terms of understanding my own identity and contemplating the interfaces between Chineseness, choreography and new technologies. I was excited to discover that these factors mixed together and influenced my dancing body; I could think about and interpret them through moving, and I could write my findings here, in this thesis, for readers to see. The reader can also peruse the digital films of the danceworks, attached in the Appendix. I will echo Yacov Sharir here and describe the research that has been accomplished as 'the bridge and the link to my continued search for new directions in future research, the development of new technologies' (2012: 182). Yet it is more than a preoccupation with technological advance. For me it has been an exploration of cultural identity through techno-choreography, linking my bodily knowledge back from the roots of my training in China (perhaps in the sense in which Taiwo points to the wider range of spiritual animation and effort qualities that shaped his transcultural performer journey) to the new branches of a growing tree of practices with interfaces. Having moved to the UK did not mean I could not resist the unmarked white western privilege underlying the notion of 'development of new technologies', untroubled by cultural difference.

In this research, I found that Chineseness contributes to the process of techno-choreography through body memories (professional trained dancing bodies with Chinese dance) and cultural objects. I have experimented, for example, with chopsticks, *gaoqiao*, handkerchiefs, fans and red silk. When working with wearable technology such as CryptogamicLightCape in *Mourning for a dead moon*, I found that the body memories of Chinese classical dance were triggered under the weight of this cape of lights. My training in the technique of *yuanchang* helped me to move and generate surprising kinesthetic images in the digital environment, dotted lines of glowing light moving across the dark night. When my dancing body entangled with the plastic costume designed by Danjoux, the gesture of *xiao wuhua* from *shenyun* was evoked. The concept of body mind, which has the grounded and refined conscious knowledge of Chinese dance in this collaboration, was automatically generated.[29]

Cultural objects contribute to the process of techno-choreography with the objects' cultural symbolism and potentials. Chopsticks have been explored in *X-Body* as a sonic instrument engaging with a microphone, Max/MSP and Isadora. As a dancer trained in Chinese dance, my body has deep memories of chopsticks dance.[30] Chopsticks also have the potential to interact with technological equipment and to be used as a metaphor in digital performance. Red silks are props for *yangge* and Chinese dance (repertoires include '*Red Silk Dance*' 红绸舞 and '*A Twisting Yangge Performer*' 一个扭秧歌的人). The virtual reality (VR) dance 'Fusing' derives from red silks. I created movements in VR by drawing with red silks in a virtual space. Further ideas then developed of writing Chinese characters through the body entangling with red silk. Working with fans in live interaction, I explored the idea of wearing culture. The material of the fans was enlarged through a web-camera, which provided suggestions for my dancing body on how to move under a fan. The shape of the fans caused live visual effects through the actor Eye++ based inside an Isadora patch. These effects influenced my choreography, which was generated through the idea of chasing and avoiding digital pixels with my head and limbs.

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[29] In her writings on the 'accented body', Cheryl Stock makes a pertinent distinction and comparison between 'conscious cultural inflections' she observed in the research production *Living Lens* (2006), staged with highly trained Taiwanese and Australian dancers, and 'unconscious cultural inflections' in *Global Drifts* (2006) which featured UK-based dancer Liz Lea (whose deeply trained dance styles blend Bharata Natyam and Indian martial arts forms with western contemporary forms) working with interactive technology. See Stock 2018: 352-355. In this context, if one were to analyse contemporary performative accents and inflections, it might be fascinating to compare productions, say, by Lin Hwai-min's Cloud Gate Dance Theatre and Pina Bausch's Wuppertaler Tanztheater, and to ask whether any homogenous choreographic style has ever been imaginable.

[30] Chopsticks dance is one style of Mongolian dance based on the pedagogy of Chinese ethnic and folk dance.

Based on the findings that Chineseness contributes to the process of techno-choreography, I argue that techno-choreography also affects the embodiment of Chineseness. In Chapter 1, I claim that one dimension of Chineseness is to consider it as an aesthetic form in Chinese dance. The three works I created, which were *X-Body, Mourning for a dead moon* (in collaboration with DAP-Lab) and *Unexpected Bodies*, are not Chinese dance. In Wilcox's study, she has claimed that Chinese dance has three core commitments, which are kinesthetic nationalism, ethnic and spatial inclusiveness and dynamic inheritance. In my understanding, kinesthetic nationalism and dynamic inheritance are connected to dancing bodies trained in Chinese dance. The concept of ethnic and spatial inclusiveness is the collective idea of 'the Chinese', which indicates the genre of Chinese dance.

> Beyond guiding the artistic work of dance practitioners, these commitments provide the theoretical and choreographic links that connect Chinese dance of the twenty-first century to its predecessors in earlier eras. These commitments both define Chinese dance as an artistic genre and mark it as a socialist legacy, and they are ultimately what give the genre its revolutionary potential at different times. (2018: 6)

In Fangfei Miao's doctoral research, she has different opinion on Chinese dance.

> I prefer addressing these two dance genres [Chinese classical dance and Chinese ethnic and folk dance] together as Chinese traditional dance. I argue in this regard that what distinguishes Chinese traditional dance as a genre is not its aesthetic form, but its embodiment of concepts, such as aesthetics, philosophies, and cultural meanings. (Miao 2019: 7)

Wilcox and Miao have defined Chinese dance from different perspectives. Reflecting on my own dancing body, which is professionally trained in Chinese dance, and on the objects I used from Chinese culture, I define the three works I have created based on techno-choreography as contemporary dance theatre works. I did not deliberately avoid producing Chinese dance works. On the contrary, I used Chinese classical dance techniques to interact with technologies. I used culturally specific objects to create new productions, and I had been familiar with these Chinese cultural objects and artifacts for many years in my dance career. However, studying the documentations of the past three years of dance work, I found that what I have created exploring Chineseness are contemporary dance compositions that embody and are inflected with my cultural specificity. I propose that there are three reasons for this

outcome. First, techno-choreography requires teamwork. All the works are intercultural collaborations. Working on live music, lighting, camera and scenography production, each of the ensemble members contributed significantly to the practical works in this research. Second, computational technology provides the potential to explore the possibilities of cultural objects in contemporary arts. Technology has enhanced the functions of cultural objects in choreography, and chopsticks, *gaoqiao*, handkerchiefs, red silk and fans as interfaces also inspired the processes of programming in digital environments and virtual realities. They are cultural symbols with abstract imaginations. Third, in this research from *X-Body* to *Unexpected Bodies*, I have come to understand that dancing bodies and cultural objects go beyond choreography. I understood and developed my dancing body and the materials as intercultural and inter-technological notions. I designed my cultural body, smart 'suit' (Isadora, camera, sensor, mannequin-projector, Tilt Brush and Oculus) and explored body memories as the cultural archives, as well as the wearables as a technology and a technique.
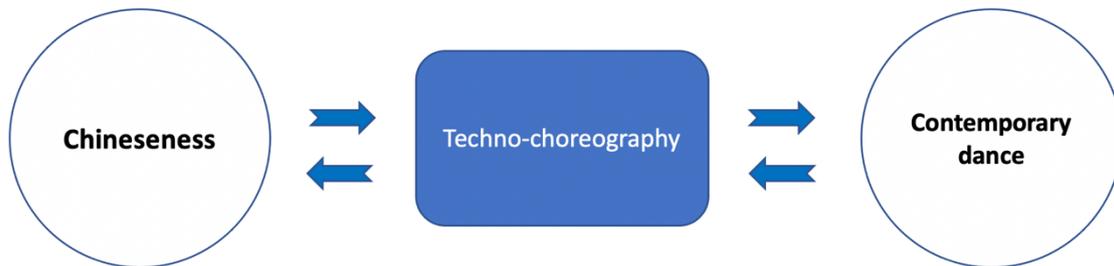
Fig. 53. Diagram of Chineseness and techno-choreography. © Photo: Zhi Xu.

In the context of techno-choreography, I found that Chineseness as an aesthetic still exists, but it could be converted from a collective idea of Chinese dance to a personal enquiry concerning cultural identity. In this research, I examined Chinese American artist Shen Wei and Chinese Canadian artist Wen Wei Wang's choreographies. I looked for common traits in their intercultural dancing bodies. In their personal styles, the aesthetics of Chinese dance trained dancing bodies are integrated with Western cultures. Chineseness persists in their dancing bodies and choreographies, and Chineseness contributes to the recognition of their artistic styles. In Wang's *Made in China*, a dance work involving digital technology designed by Sammy Chien, exploring Chineseness was the core of the work. Reflecting on my creations, I also looked into Chineseness in my own intercultural dancing body. A range of

experiences have contributed to my understanding of my cultural identity and the development of my intercultural dancing body. These experiences have included collaborations with artists from various countries; academic seminars I attended; a series of artist training programmes provided by The Place when my work was selected for *Revolution 2019*; the Gaga intensive courses at Rambert; the BA Limón classes I attended at Roehampton; days spent at the British Museum, the Victoria and Albert Museum, The National Gallery and the Tate absorbing nutrients from other artistic forms; and performances I watched at Sadler's Wells, Southbank Centre, Barbican Centre, and the Phoenix Theatre. Techno-choreography is intercultural. The idea of Chineseness I explored situates in a shared space which includes my dancing body and the body of the digital. Susan Broadhurst claims that 'In digital performance, the digital is essential, as is the body. Digital performance artists are trained to use digital technologies as an important creative tool for exploring the body' (2017: 20). My intercultural dancing body is the coalition of Chineseness and the digital.

This practice-based research has enabled three new contributions to dance studies to emerge. First, unlike dance scholars studying Chineseness from the perspectives of Chinese dance history, dance politics, or dance anthropology, I provide a contribution to the study of Chineseness based on the methodology of techno-choreography. I have created three full-length dance works premiered with public audiences, completed three dance films, and provided detailed analyses of the process of techno-choreography in this thesis. Second, this research contributes to the study of dance technology. Based on the theories of choreographic systems and immersion, I created a methodology named techno-choreography, which contributes to Birringer and Rokeby's study on interactivity from the perspectives of culturally specific, in this instance Chinese dancing bodies and cultural objects. Third, this research studies Chineseness from the idea of interculturality based on the study of Shen Wei, Wen Wei Wang and the reflection on my own dancing body. We have all created dance works involving digital technology, interactive design, installation and new technologies such as virtual reality, augmented reality, mixed reality and holography. I argue that Chineseness persists as the core for artists and choreographers abroad who have professional Chinese dance training backgrounds, and Chineseness is integrated with the cultures those artists live within (whether that is New York, Vancouver or London), enabling the formation of individual styles after years of personal study and enquiry. In *Unexpected Bodies*, I also provided a set for an interactive system (consisting of patches based on Isadora software, webcams, and Oculus VR headset/software), which could provide opportunities for other

practitioners, as a kind of 'open source', to explore their movement generation and their cultural or everyday objects in a generative techno-choreographical environment.

The significance of this research is to provide a methodology of techno-choreography for practitioners in dance, theatre and music so that one can study further kinesthetic movement and sound generation in interactive and virtual environments. This research is also important to scholars and practitioners in Chinese dance studies. To date there have been very few practice-based research studies in dance and technology looking at Chineseness. The practice works and theoretical arguments generated through this thesis could fill the gap. This research provides references to computer-based researchers in the fields of game design, human-computer interaction and immersion design. This doctoral research was my journey towards understanding Chineseness and techno-choreography. I hope to expand this practice-based research examining the entanglement of Chinese folk garments and new technologies, thus widening the scope of co-design, including a stronger concern for wearable garments and costumes in light of their cultural specificity. This research, therefore, points towards future inflections and dynamic potentials of cultural heritage in a global and networked environment, where I would wish to develop the methodology of techno-choreography further based on quests of cultural identity, material, architecture, body mind and extended reality.

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Appendices

Appendix 1. Glossary

People	
Bai Shuxiang	白淑湘
Chen Ailian	陈爱莲
Choe Seung-hui	崔承喜
Dai Ailian	戴爱莲
Fangfei Miao	苗芳菲
Fu Zhaoxian	傅兆先
Gao Dakun	郜大琨
Gao Jinrong	高金荣
Gao Yanjinzi	高艳津子
He Yanyun	贺燕云
Jiajie Zhou	周家洁
Jiang Dong	江东
Jin Xing	金星
Kong Jiang	孔江
Li Chao	李超
Li Qing	李青
Li Zhengyi	李正一
Limeihui Zhu	朱丽美惠
Liu Chun	刘春
Liu Enbo	刘恩伯
Liu Xiao	刘霄
Liu Yongxia	刘永霞
Long Yinpei	隆荫培
Luo Xiongyan	罗雄岩

Lv Yisheng	吕艺生
Ma Jiaolong	马蛟龙
Mei Lanfang	梅兰芳
Miziying Wang	王米紫莹
Ouyang Yuqian	欧阳予倩
Peng Song	彭松
Qemberxanim	康巴尔汗·艾买提
Qiu Xia He	何秋霞
Rumeng Li	李如梦
Shen Wei	沈伟
Sheng Jie	盛婕
Sun Tianlu	孙天路
Sun Ying	孙颖
Tang Mancheng	唐满城
Tang Shiyi	唐诗逸
Tian Tian	田湉
Wang Jiaming	王家明
Wang Liancheng	王连成
Wang Mei	王玫
Wang Ping	王萍
Wen Wei Wang	王文蔚
Wu Xiaobang	吴晓邦
Wu Zhenyan	吴珍艳
Wu Zupei	吴祖培
Xiao Xiangrong	肖向荣
Xu Rui	许锐
Xu Shuying	许淑英
Ye Ning	叶宁
Yu Rongling	裕容龄

Yuan He	袁禾
Zhao Zhibo	赵知博
Zheng Huihui	郑慧慧
Zhi Xu	徐至
Zhu Hai	朱海
Zhu Ping	朱萍
Institutions	
Central Academy of Drama	中央戏剧学院
Choe Seung-hui Dance Research Course	崔承喜舞研班
Dance Drama Research Group	舞剧研究小组
Dance Drama Troupe	舞剧队
Dance Ensemble of Central Academy of Drama	中央戏剧学院舞蹈团
Kongkong Dance Studio	空空舞室
Oriental Dance Research Institute	东方舞蹈研究所
People's Cultural Work Troupe	人民文工团
Wuyun Ban	舞运班
Dance terms, artistic works and others	
A Twisting Yangge Performer	一个扭秧歌的人
Anhui Flower Drum	安徽花鼓灯
Attraction	鸟巢吸引
Baguazhang	八卦掌
Chang, nian, zuo, da	唱念做打
Chou wu	绸舞
Dantian	丹田
Di Yangge	地秧歌
Dongbei yangge	东北秧歌
Dunhuang	敦煌
Fushun yangge	抚顺秧歌

Gaoqiao	高跷
Gaoqiao yangge	高跷秧歌
Guzi yangge	鼓子秧歌
Haicheng gaoqiao	海城秧歌
Haiyang yangge	海洋秧歌
Han-Tang gudianwu	汉唐古典舞
Huxi	呼吸
Jiaozhou yangge	胶州秧歌
Jingju	京剧
Kuai jiao	侩脚
Kunqu	昆曲
Liaoxi gaoqiao	辽西高跷
Niu yangge	扭秧歌
Qi	气
Qiba	起霸
Qise	气色
Qiwu	旗舞
Qixue	气血
Qiyun	气韵
Shan shui	山水
Shandong yangge	山东秧歌
Shen	神
Shenyun	身韵
Suona	唢呐
Wenyanwen	文言文
Xiangju	湘剧
Xiao wuhua	小舞花
Xihe Jianqi	*西河剑器*
Xiliang Yue	西凉乐

Xiqu	戏曲
Yangge	秧歌
Yin yang	阴阳
Youyuan Jingmeng	*游园惊梦*
Yuanchang	圆场
Yunlü	韵律
Yunqi	运气
Zoubian	走边

Appendix 2. Sketches

*X-Body* (2018)

Scene 1
Digital environment

X-Body

four dancers

Go up

Solo with circle

black

Scene 2
Interactive environment

Projection

Q1. How many projections?
Q2. Lighting effect

dancer

Live camera

Scene 3.
Sonic

side lights
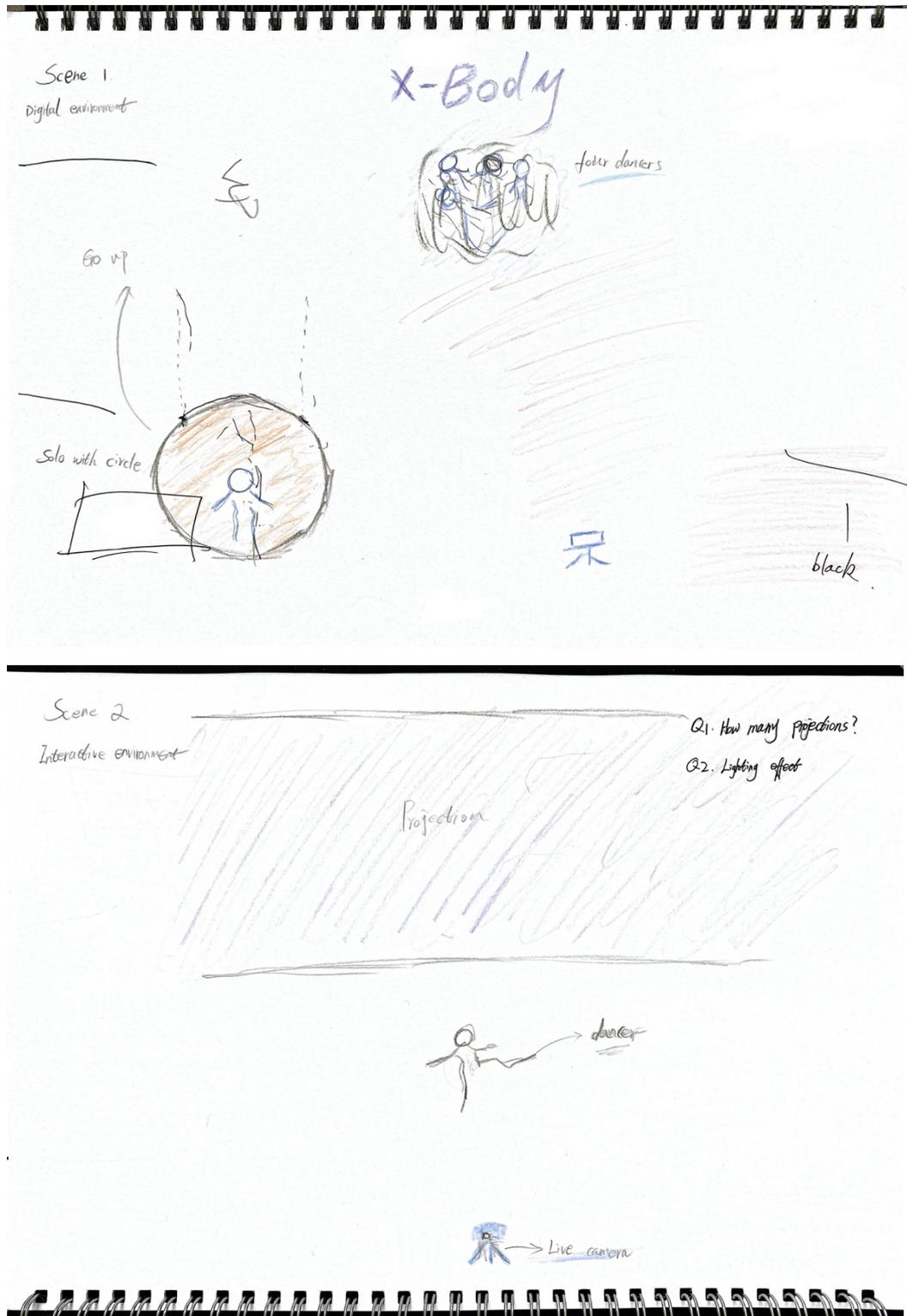
Q1. Quality of the cable

Q2. Go up and down

Drew

Scene 4.
Digital Mirror

installation
move on from side

Scene 5
Moving Space
Run

Unexpected Bodies (2020)

< Unexpected Bodies > Scenography   12. Nov. 2020

scene one

projection

Curtain face

Moving in spot.
covered by black

Scene Two : Gaoqiao

projection

mapping
Red Silk

Gaoqiao

Red Silk going up
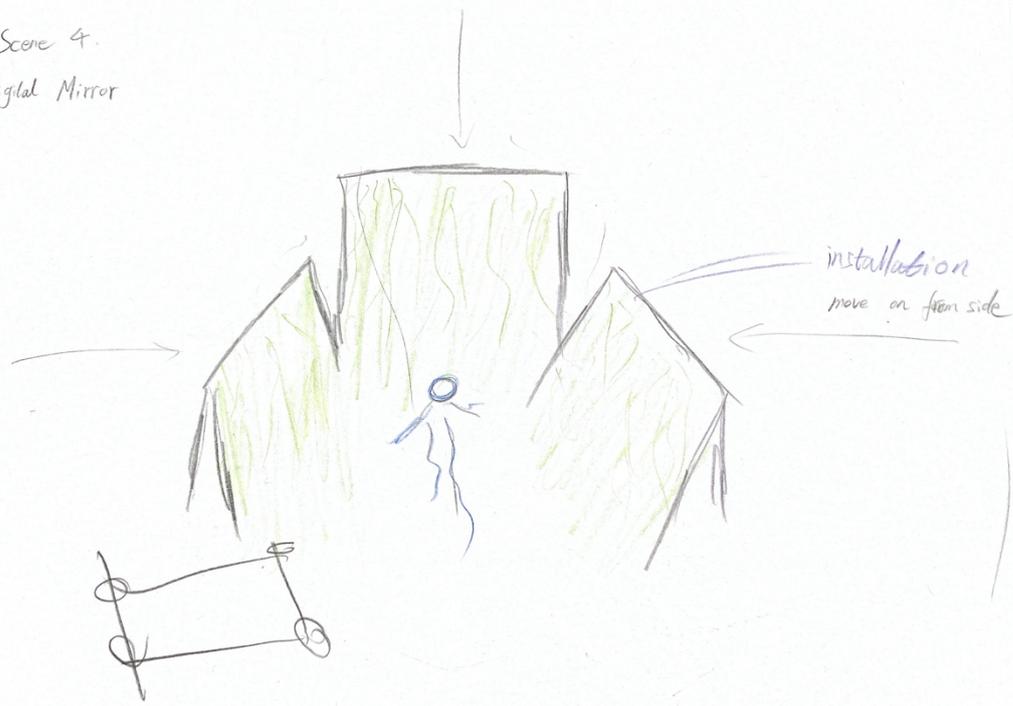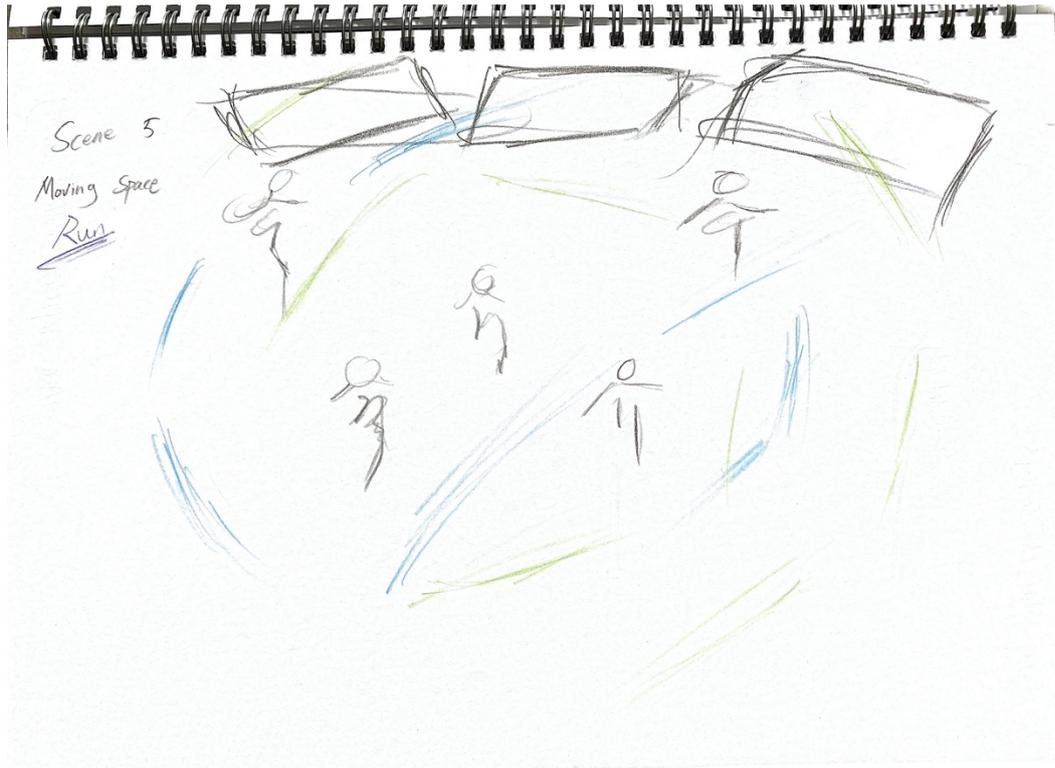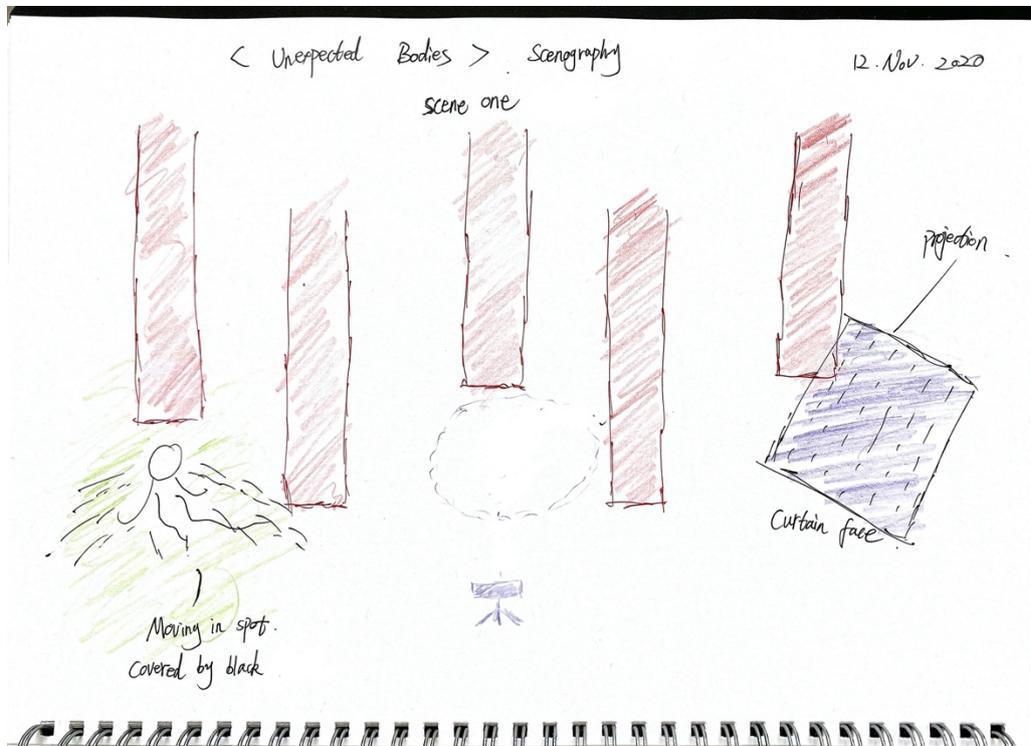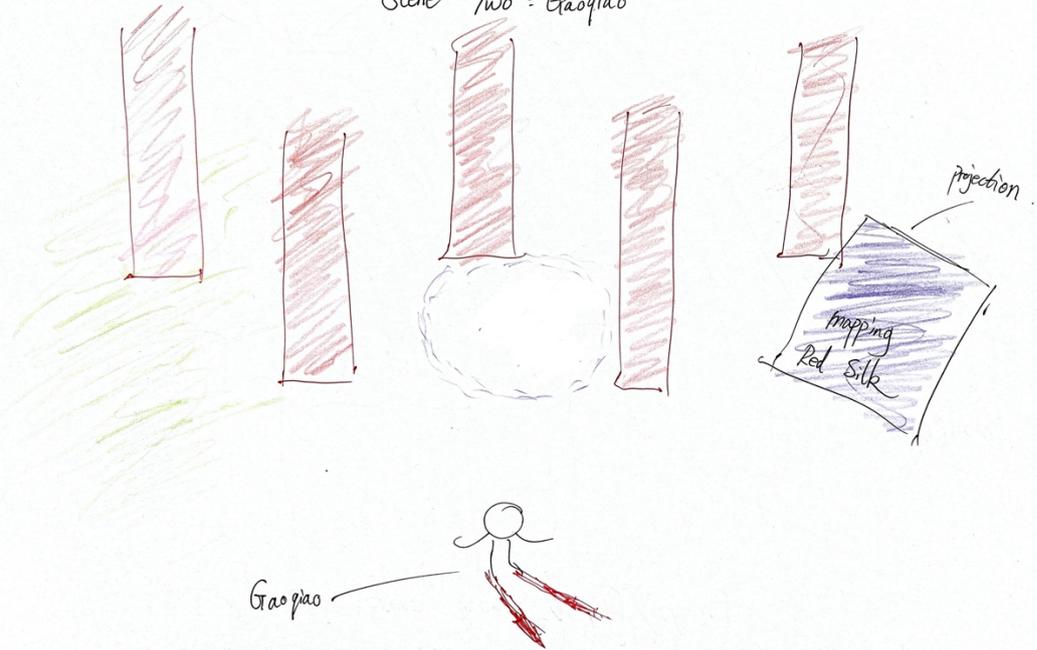
Scene Three : Tracking / chasing

Projection

Isadora
Actor
effects

motion Capture

Scene Four: Exploring

wearing VR

Projecting what I see.

City

Scene Five: Touching

I am touching what I
created, danced, built
in theatre. Re-enter

the virtual-real environment
by myself. Intimating the
environment, reviewing what
happened in the space.

VR

projection

The immersive
theatre I created
through Techno-choreography
using 360 camera

Unexpected Bodies
December 2020

hanging red silk

Projection

mannequin

Web camera

Projector

Projector

Spot

computer

Oculus VR

Music
.
Light
Control

Appendix 3. Performance Posters

Unknown, unstable, unexpected:
Cultural dancing bodies inhabit a digital environment
considering a cultural identity

Dance Technology:
X-Body 未知身体

By Zhi XU 徐至作品
Antonin Artaud Theatre
Brunel University London
26 September 2018, 7PM
Admission Free

Choreographer: Zhi Xu
Dancers: Jiajie Zhou, Miziying Wang, Rumeng Li, Limeihui Zhu, Zhi Xu
Composer: A-KIN (Drew Egan), Alva Noto, Kiyoshi Yoshida
Installation and Costume Design: Zhi Xu
Camera: Johannes Birringer
Lighting & Technical Direction: Graeme Shaw
Photographer: Huazhen Hu
Poster Designer: Su Wang
Production: Triangle Motion Limited

Zhi XU

the place

Resolution 2019

Unknown, unstable, unexpected:
Cultural dancing bodies inhabit a digital environment
considering a cultural identity

Dialogue: X–Body

Zhi Xu 徐至 作品

13 February 2019, 7:30 pm
The Place
17 Duke's Rd, London, WC1H 9PY

Choreographer: Zhi Xu; Dancers: Jiajie Zhou, Miziying Wang, Rumeng Li, Limeihui Zhu, Zhi Xu
Sound Artist: A-KIN (Drew Egan); Technical Advisor: Graeme Shaw
Lighting: Charles James; Projection: Saga Styrmisdottir; Photo: Yufei Liang; Poster: Zhi Xu
Production: Triangle Motion Limited

(Scan me)

Mourning for a dead moon

a dance work by DAP-Lab

Antonin Artaud Theatre

Saturday, December 7, 7:30pm

Admission Free
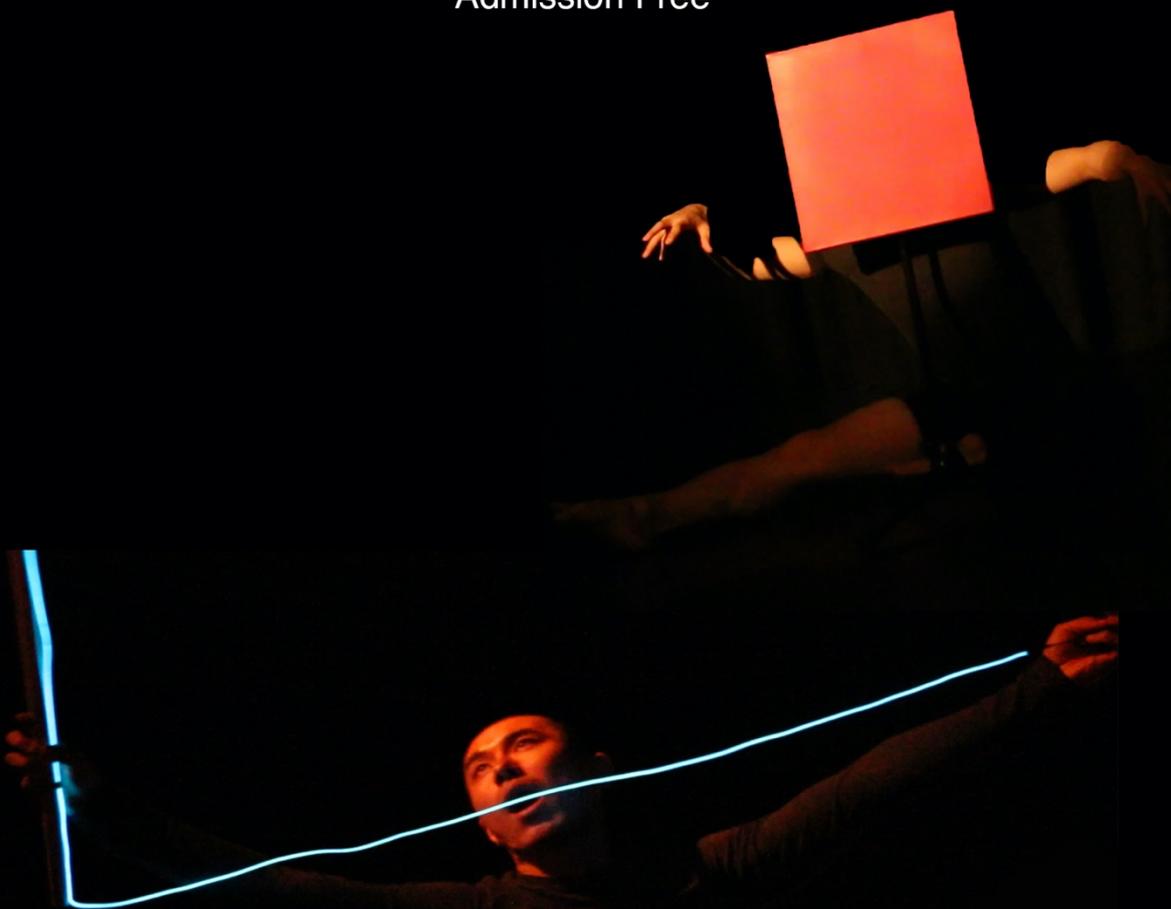
Directed by Johannes Birringer; Design/art direction: Michèle Danjoux

Featuring: Zhi Xu, Macarena Ortúzar, Yoko Ishiguro, Helenna Ren

Music: Dee Egan, Louie Marlow; Lighting: Charles Manister

Electronic Design: Maria Dada, Ragnar Hrafnkelsson

遇见 *Unexpected Bodies*

Zhi Xu 徐至 作品
Artaud Theatre - Brunel University London
Filming Premiere - 9 December 2020 at 8 pm

Choreography, Performance & Programming: Zhi Xu
Music: Dee Egan; Camera: Johannes Birringer, Eve Gabarre
Technical Advisor: Graeme Shaw
Technicians: Bill Forbes, Phil Maguire, Daniel O'Riordan; Photography: Yifan Li

**Appendix 4.** *X-Body* **(2018) – Documentation of Rehearsal Process**
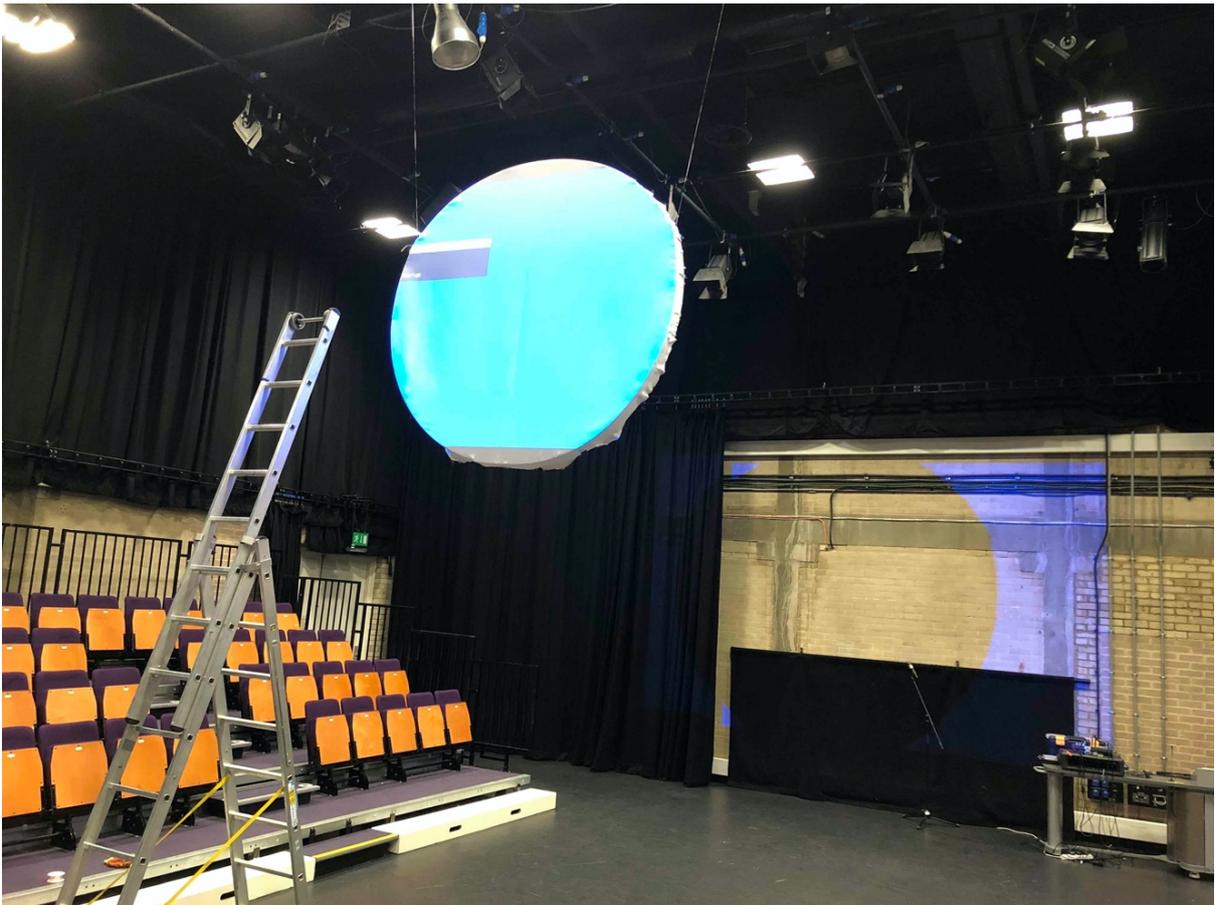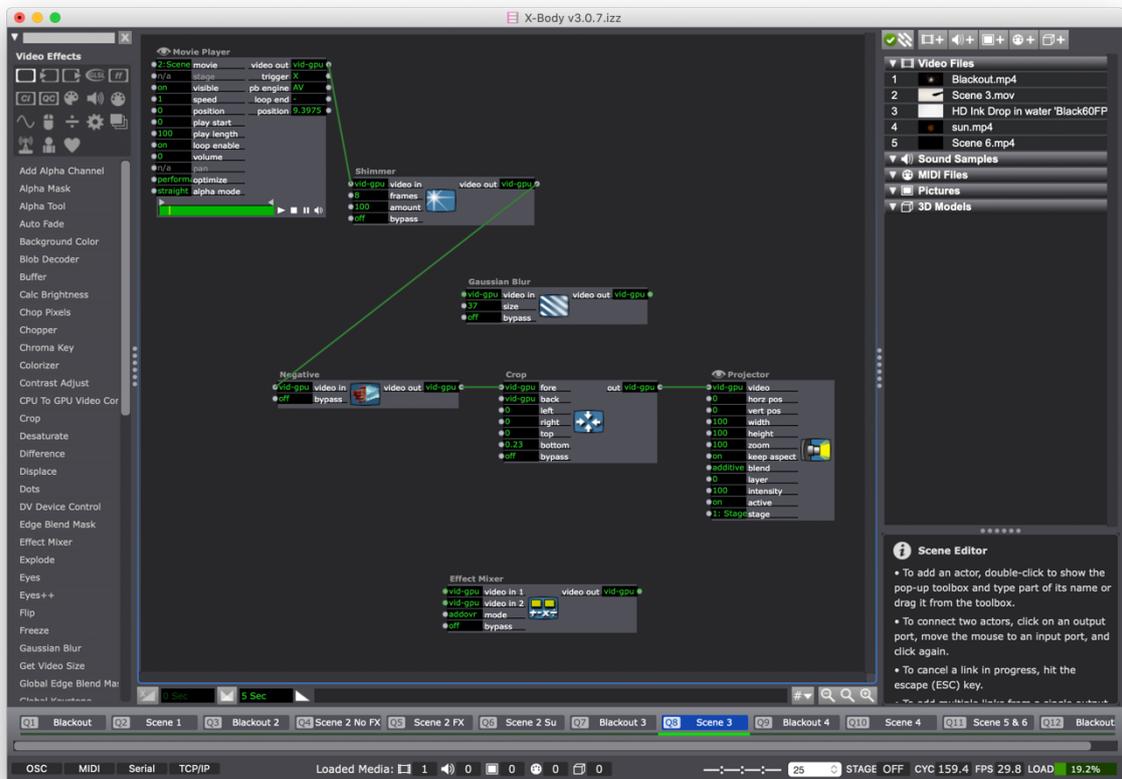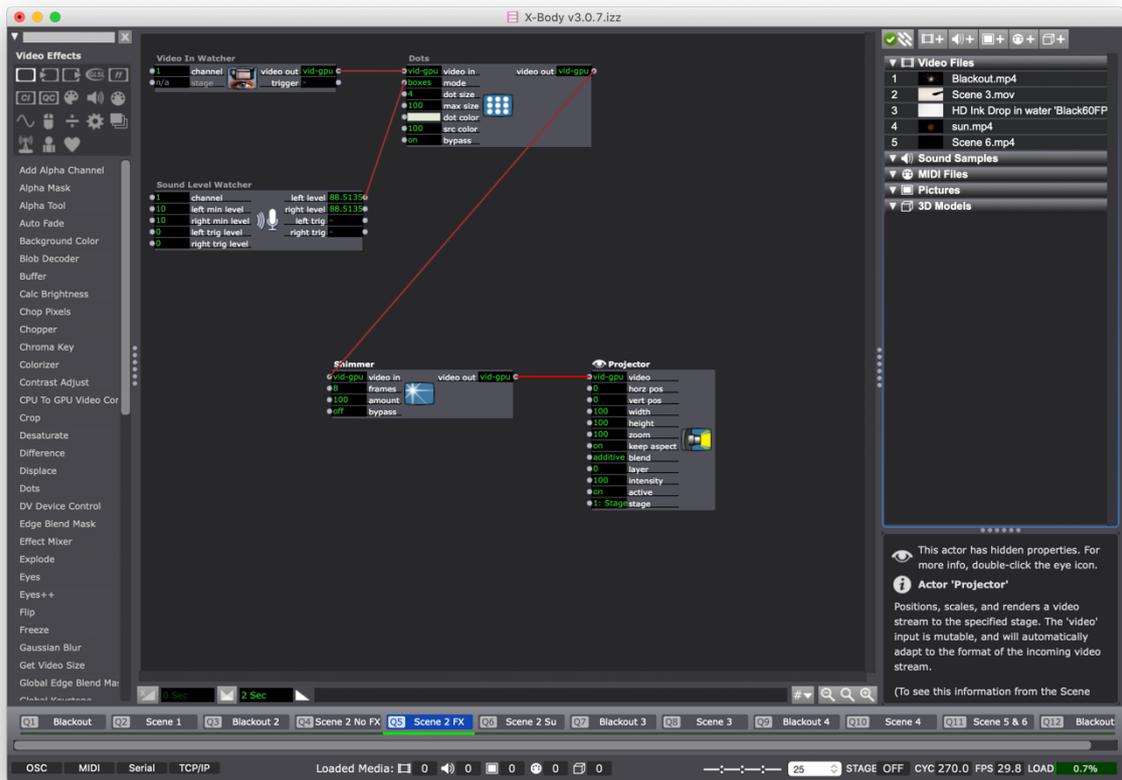
《秋风萧萧愁杀人》

出自汉代诗人佚名的《古歌》。它是"胡地"戍卒的思乡怀归之作。

秋风萧萧愁杀人①。出亦愁，入亦愁。
座中何人谁不怀忧？令我白头。
胡地多飚风②，树木何修修③！
离家日趋远，衣带日趋缓。
心思不能言，肠中车轮转④。

注释：
①萧萧：寒风之声。
②胡地：古代胡人居北方，故后即用以代指北方。飙（biāo）风：暴风。
③修修：与"翛翛"通，鸟尾敝坏无润泽貌，这里借喻树木干枯如鸟尾。
④思：悲。末二句是说难言的悲感回环在心里，好像车轮滚来滚去。

(Miziying Wang sings the poetry in the scene *Qi*)

Appendix 5. *Mourning for a dead moon* **(2019) – Documentation of Rehearsal Process**

(in collaboration with DAP-Lab © Photos: DAP-Lab)
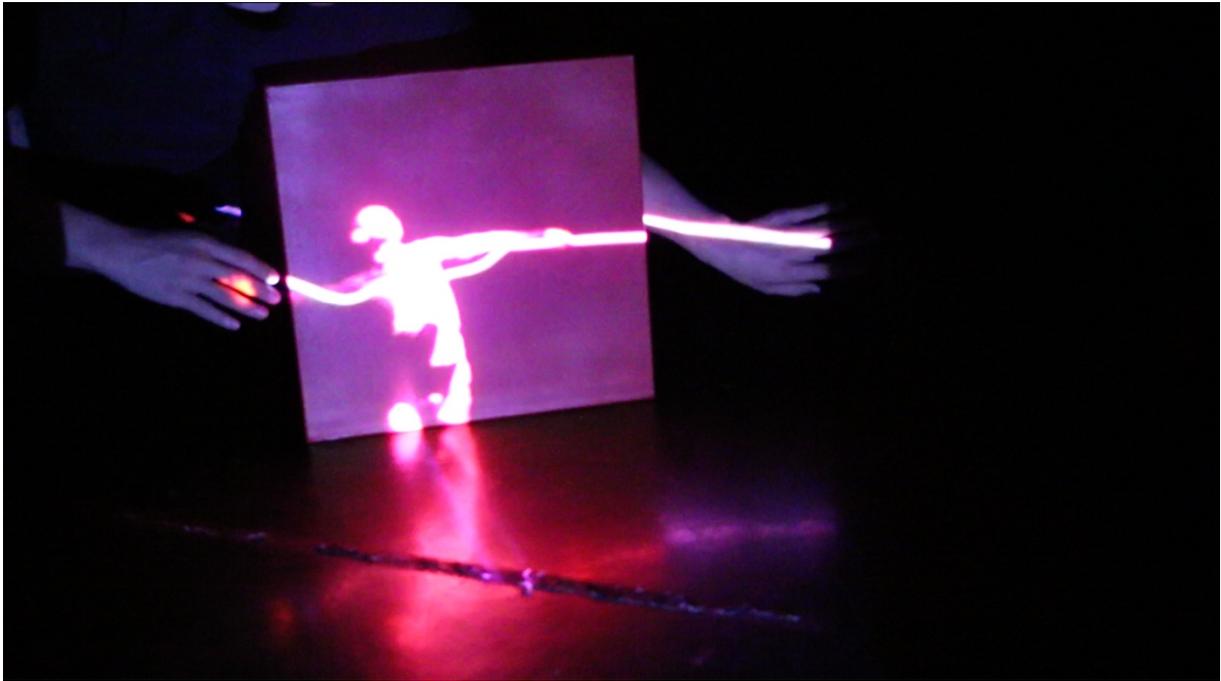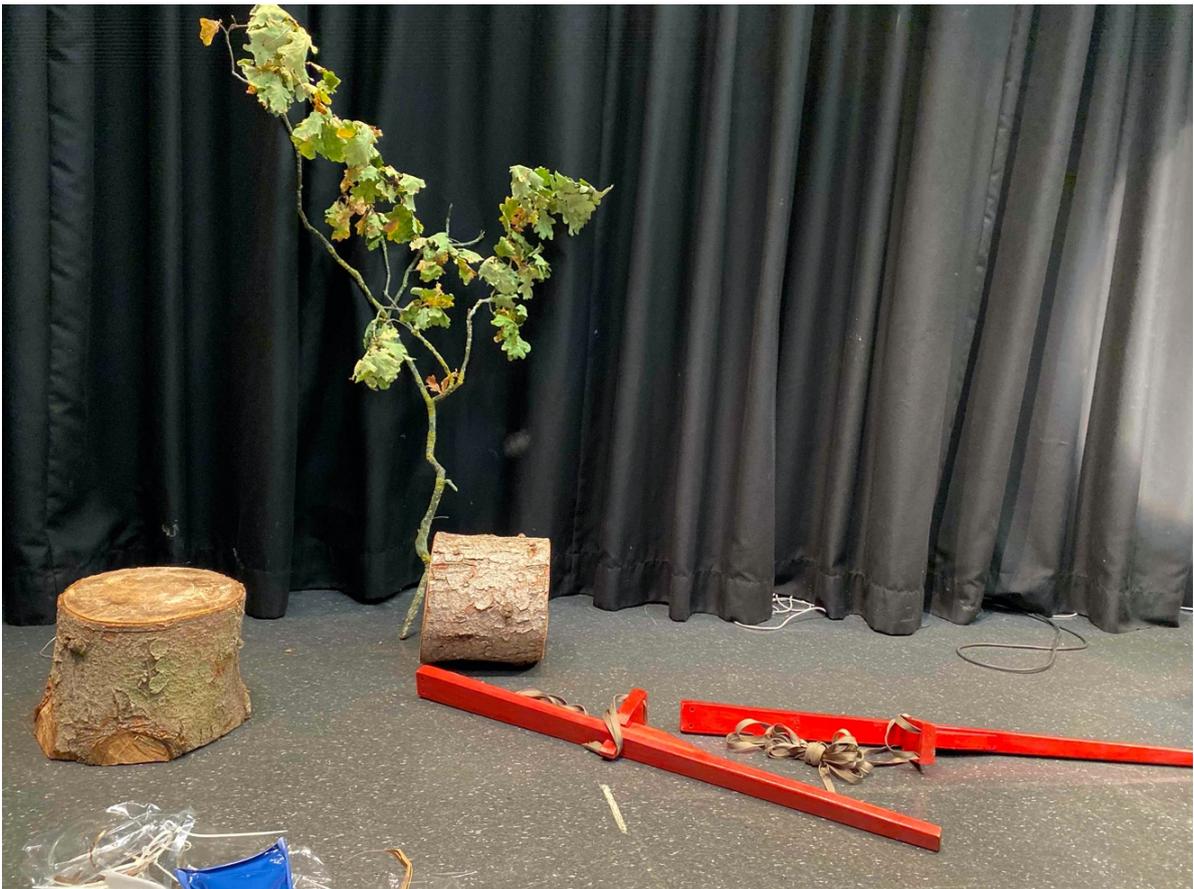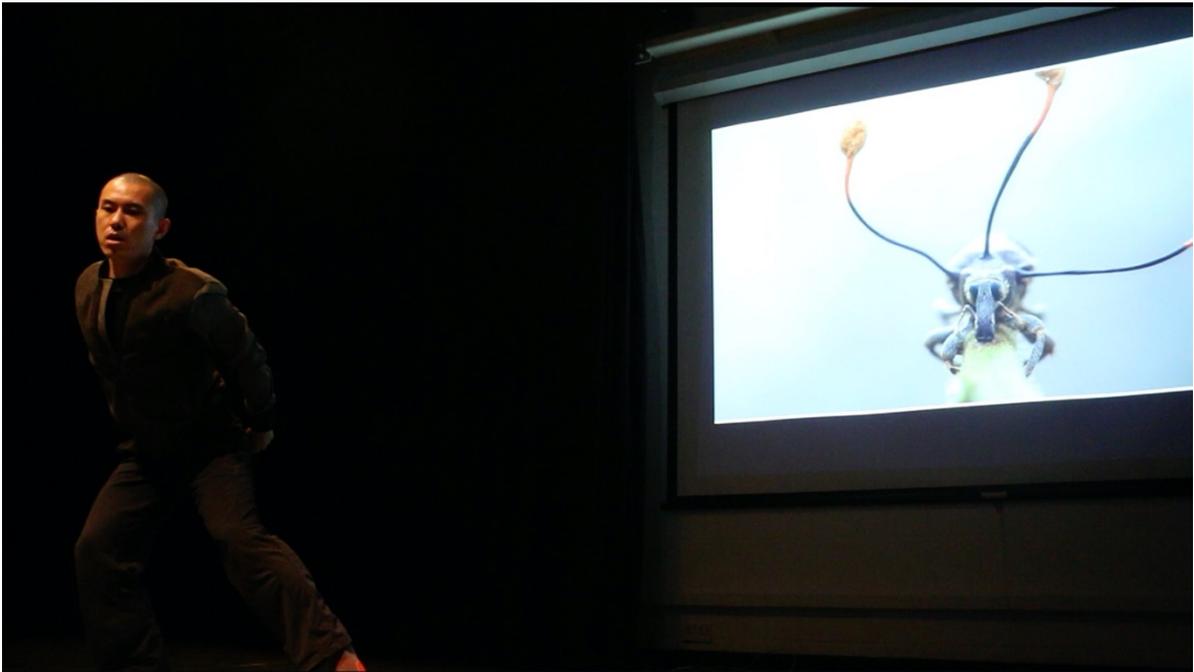
Appendix 6. *Unexpected Bodies* **(2020) – Documentation of Rehearsal Process**