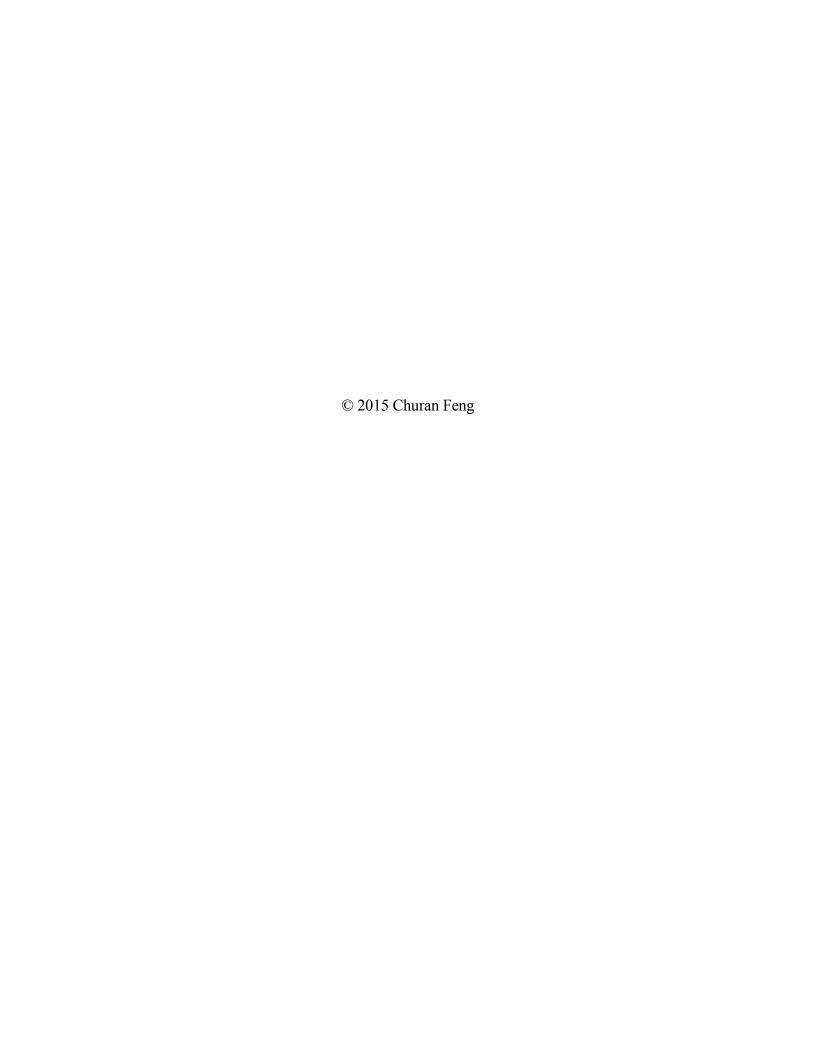VOYAGE TO THE OTHER SHORE

by

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A TERMINAL PROJECT

Presented to the School of Music and Dance of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Master of Music in Intermedia Music Technology

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"Voyage to the Other Shore ," a project prepared by Churan Feng in partial fulfillment of the requirements for the Master of Music degree in the School of Music and Dance. This terminal project has been approved and accepted by:

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Jeffrey Stolet, Chair of the Examining Committee

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Date

Committee in Charge: Jeffrey Stolet, Chair
                                  Chet Udell
                                  John Park

Accepted by:

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Director of Graduate Studies, School of Music and Dance

Abstract

Title: *Voyage to the Other Shore*
Type: Live stereo performance composition, Microsoft Kinect, Max/MSP and Kyma

Voyage to the Other Shore is an interactive musical composition that uses the Microsoft Xbox 360 Kinect sensor as the interface for performance. This piece uses Delicode NI Mate to receive data from the Kinect, Max/MSP/Jitter as the environment to execute data mapping and scaling, and Symbolic Sound's Kyma system as the sound-producing, final performance environment. The Kinect transforms body movement, which look like conducting and dancing motions, into data streams that controls the sonic fabric of the composition. Musical recording from both musical and non-musical sources were made in both in United States and China to form the fundamental material of the composition. The composition is approximately nine minutes in duration and has eight sections each representing the different emotions and moods I experienced during the time of my stay here in U.S. and how two cultures impact me.

Keywords: University of Oregon; School of Music and Dance; Intermedia Music Technology; Interactive music; Electronic music; Ambient music; Microsoft Xbox 360 Kinect; Delicode Ni Mate; Max/MSP/Jitter; Symbolic Sound Kyma; Churan Feng.

Content Details

1. **Voyage to the Other Shore Perform.ktl** – Kyma Timeline file
2. **Analyze File Folder** contains Ten (10) Kyma spectrum files
3. **Early draft Folder** contains five (5) .jpg files
4. **ImageDisplay Folder** contains 11 .png files
5. **Mus 645 Folder** contains one (1) .aif file
6. **Recording File Folder** contains two (2) .aif files
7. **Sample File Folder** contains eleven (11) .aif files and (two) 2 .wav files
8. **Ni Max.maxpat** – Max/MSP patch

Extra-musical Intent

Voyage to the Other Shore is an interactive composition. As an international student from the South China coastline, I have been studying here at the University of Oregon near a coastline in Northwest America. The meaning of "other shore," for me, could be either to a distant land or to my native homeland. During more than two years, I have learned and experienced things from my school, daily life, social media and culture here in the U.S. All of these ideas interest me and are the motivations of this piece.

Using the Microsoft Xbox 360 Kinect as the instrumental interface, I performatively provide data streams based on my spatial position that trigger and control sound

producing algorithms present in Kyma, the programming environment I use for this composition. Voices, instruments and field recordings from both the U.S. and China are used as source material for the music of this composition. Seeking to create an ambience that articulates how different cultures impact me, this piece is like a timeline of the almost three-years story, closing with the end of my journey in America, and the impending voyage back to the other shore of my homeland.

Details of pre-performance preparations

The first steps of the performance process are:
1. Open Kyma timeline "Voyage to the Other Shore"

2. Open Max/MSP patch "NI Max" for transferring data from NI Mate to Kyma use

3. Copy Kyma's OSC IP address into "NI Max" patch

4. Re-enter port number 8000 (Kyma in standard) to refresh

5. Open NI Mate and wait until the refresh rate initialize to 30 frames per second

6. Set the IP address local (127.0.0.1)

7. Check the output port in NI Mate to assure that same as the "udpreceive" port in "Ni Max" patch

8. Turn on the toggle in "NI Max" patch and minimize the window

9. Check the view range in NI Mate and adjust the position, height and angle of the Kinect

10. Start the Kyma timeline;

11. Check the Virtual Control Surface in Kyma (VCS) to confirm that data is passing through the system and is controlling the VCS faders

12. Trigger the beginning of the piece

Hardware required to perform the composition

MacBook Pro (Laptop)
Symbolic Sound Paca(rana) Computer
Microsoft Xbox 360 Kinect Sensor
Audio Interface

FireWire 800 Cable with Thunderbolt to FireWire Adapter
Ethernet Cable with Thunderbolt Ethernet Adapter
USB AC Adapter Power Supply Cable Cord for Kinect

Kinect data used in the performance of the composition

Head (X and Z values)
Torso (X and Z values);
Left hand (X, Y, and Z values);
Right hand (X, Y, and Z values);
Hand distance (values)
Body bow (values)
Triggers (left and right values)

The list all Kinect data output and available for use (as OSC and MIDI messages) is:

Head (X, Y, Z)
Neck (X, Y, Z)
Torso (X, Y, Z)
Left shoulder (X, Y, Z)
Right shoulder (X, Y, Z)
Left elbow (X, Y, Z)
Right elbow (X, Y, Z)
Left hand (X, Y, Z)
Right hand (X, Y, Z)
Left hip (X, Y, Z)
Right hip (X, Y, Z)
Left knee (X, Y, Z)
Right knee (X, Y, Z)
Left foot (X, Y, Z)
Right foot (X, Y, Z)
Body bow
Hand distance
Triggers (left, right)

Notable technical issues and challenges

1. Although it shows in the Delicode NI Mate window that the live refresh rate was 30 frames per second, the actual data refresh rate from NI Mate varied between 10 and 30.

2. After using more than ten of the X-Y-Z elements output from the Kinect, the large amount of the data proved to have the potential to crash the Max/MSP environment. My solution for this issue was to use a *speedlim* object to restrict the reception rate of the

incoming data. Ultimately I used fourteen X-Y-Z elements, applied the *speedlim* object to each, and specified that data could pass only at the rate of one datum per every 20 ms. This solution proved to make the Max patch stable.

3. Using more data streams did directly make for a better composition or a better performance. In the course of the creation of the work I found that it was not really practical for the performer (me) to focus on more than ten motion-driven-faders at a time while performing.

4. The data originating from hand, elbow, shoulder, hip, knee and foot have similar characteristics because the same body parts are actuating the movement. By choosing the data stream that is to control each of the musical parameters one designs the manner in which one will perform the composition.

5. The height and angle of the Kinect significantly influences depth data (on axis-Z). Making sure the placement of the as close as possible to being the same for each performance playing the composition becomes much easier.

6. The environment light conditions influence how the user is recognized inside of the NI Mate. Furniture and a variety of objects will sometimes be recognized as the user as a mistake. A bright, sufficient space without obstacles within the viewing periphery is ideal. There should be no moving objects within the viewing range of the Kinect.