香港城市大學
City University of Hong Kong

CENTRE FOR APPLIED COMPUTING AND INTERACTIVE MEDIA

CLIP

CLIP Survey Lessons

ACIM conducted a series of survey to evaluate the effectiveness of T&L in IVEs with 580 students within the project period. In collaboration with graduate and undergraduate humanities courses in CityU and HKBU, ACIM invited lecturers to teach lessons in Gallery360 with immersive T&L content including *Pure Land: Inside the Mogao Grottoes at Dunhuang* and *Hampi*. The survey result is generally positive, for instance 67% of students find that they learn better in IVEs.

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BIEBER

Interactive Mathematics Teaching Tool

Working closely with Prof. Felipe Cucker from the CityU Mathematics Department, we have developed an immersive 3D 360-degree teaching module. It involves the visualization of an equation of the tangent plane to a surface. By means of this real time 3D immersive visualization of different variables in the equation, it shall help students to better 'read' and understand the relations between these variables.

The implementation takes place within our Gallery360 projection environment where up to 30 students can gather in a class. Important aspects of the implementation are a custom designed/developed user interface utilizing a hand-held iPad and a 6-axis joystick. The tablet allows the user to specify the equation variables while the 6-axis joystick allows complex spatial manipulations of the resultant 3D visualization of those equations, including rotation, translation and zoom.

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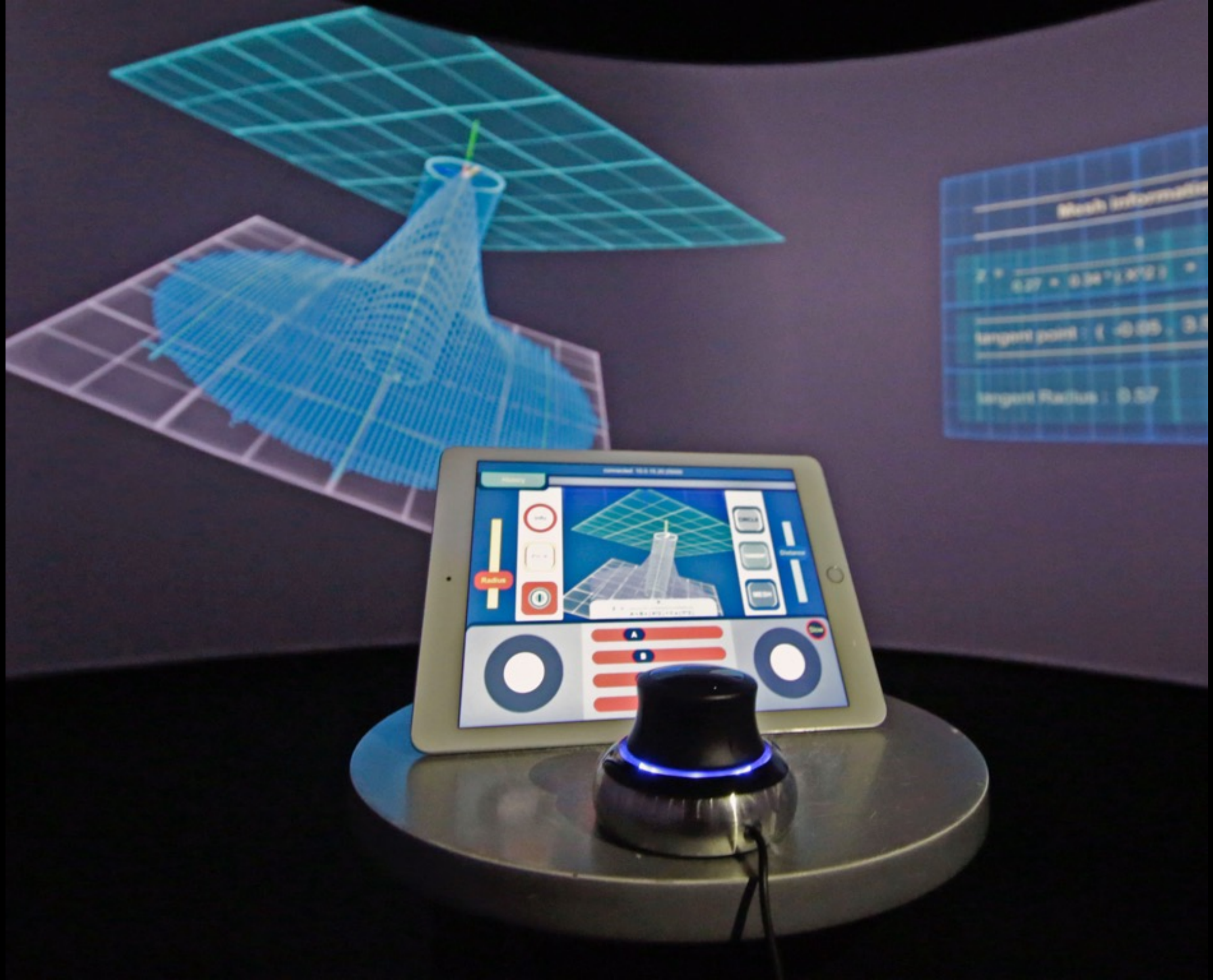
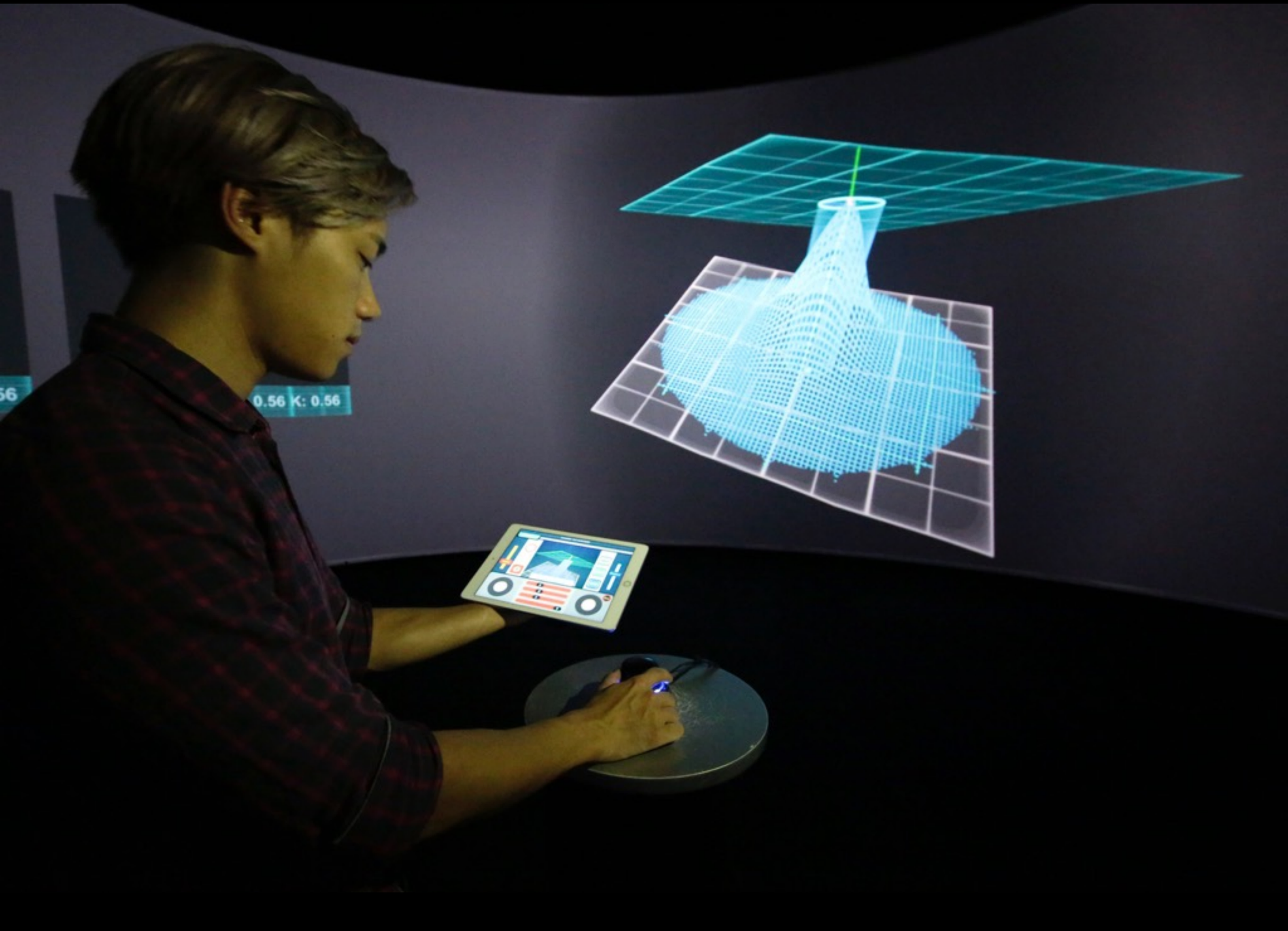
56 C: 0.56 K: 0.56
A: 0.56 B: 0.56 C: 0.56 K: 0.56
Mesh information
A: 0.10 B: 0.10 C: 0.10 K: 0.10

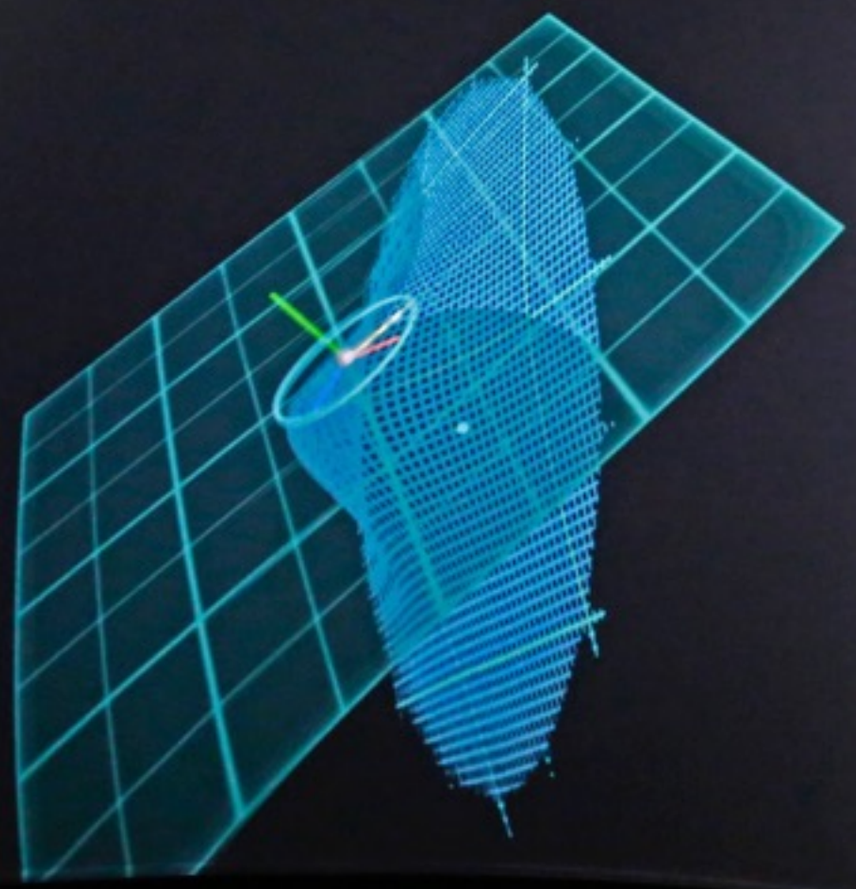

Mesh information
0.4
Z =
0.05 + 1 * (X^2) + 1 * (Y^2)
tangent point : (-0.74 , 0.63 , -0.22)
tangent Radius : 1.06


Mesh information
tangent point : (-0.05 , 3.5
tangent Radius : 0.57
Radius


0.56 K: 0.56


A: 0.56 B: 0.5
C: 0.56 K: 0.56


A: 0.56 B: 0.56 C: 0.56 K: 0.56
A: 0.08 B: 0.08 C: 0.08 K: 0.08

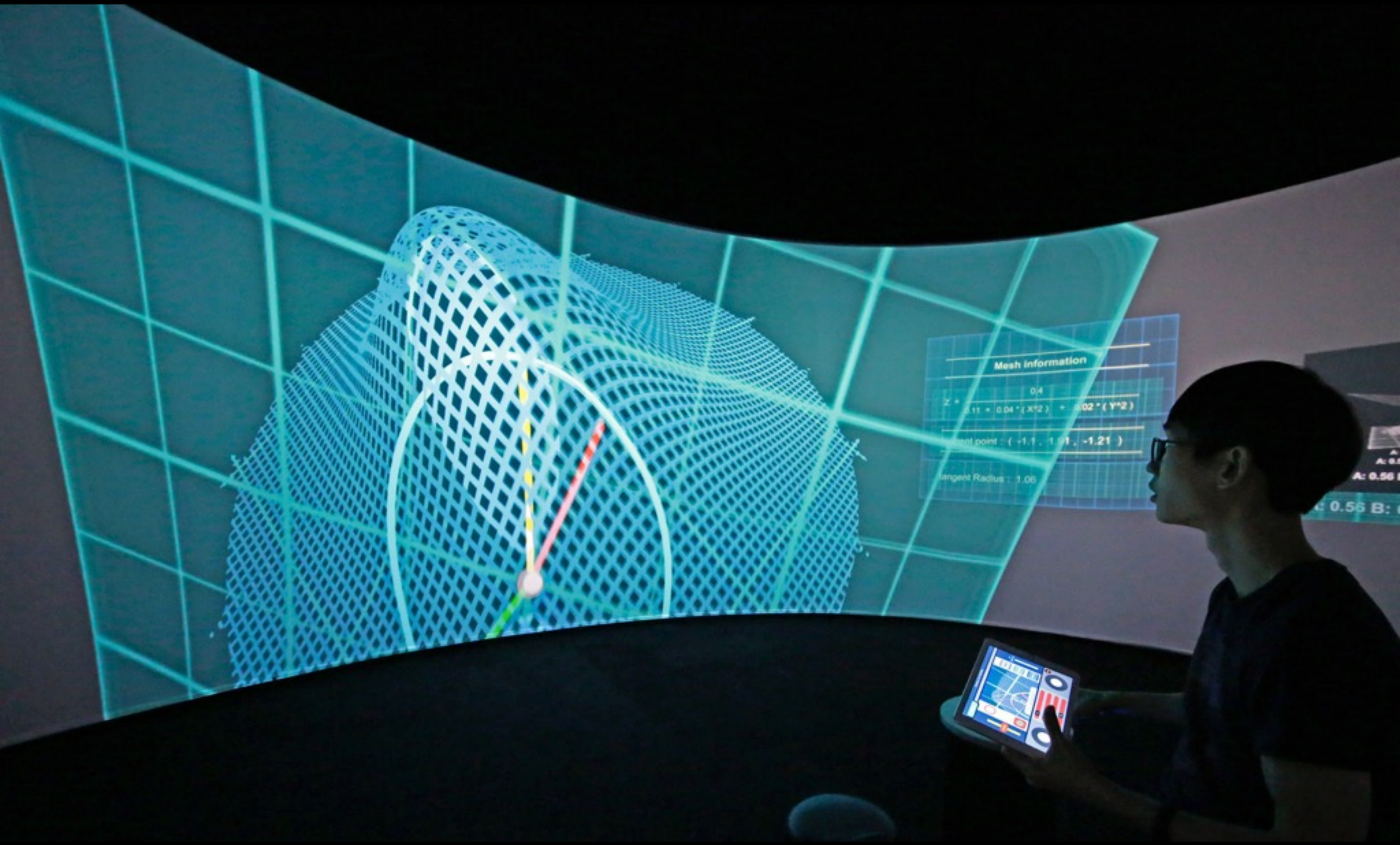


Mesh information

$$Z = \frac{1}{0.56 + 0.34 * (X^2) + 0.36 * (Y^2)}$$

tangent point : (0.5 , 1.35 , 0.48)

tangent Radius : 0.57


Mesh information

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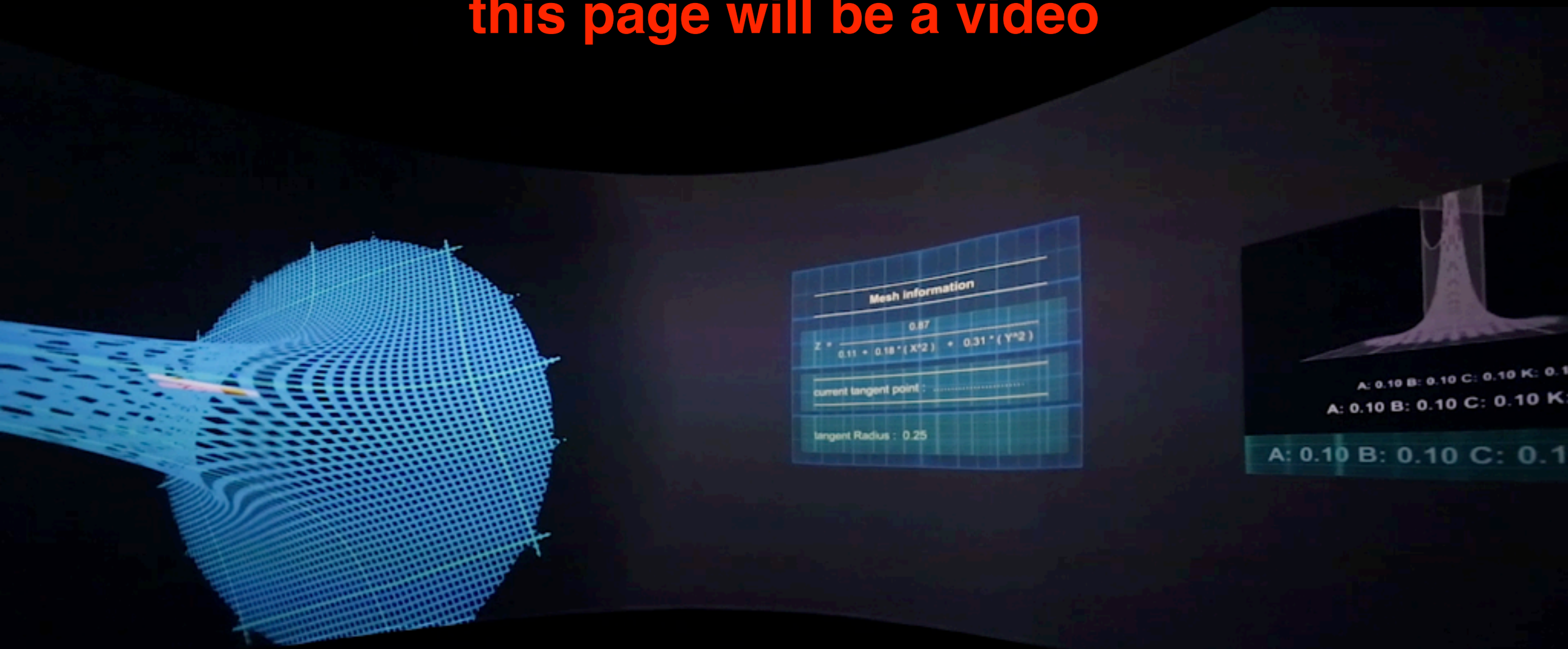

Panoramic Documentation of Sheep Shearing Farm

Working closely with Prof. Michael Reichel from the School of Veterinary Medicine and Life Sciences, we have prototyped an immersive virtual site tour to a sheep shearing station in South Australia. Utilizing industry benchmark high-resolution panoramic video cameras (FLIR Ladybug, Canon EOS Mk4 with fisheye lens), 180- and 360-degree movies were made on the shearing shed to create a fully surrounding documentation of the entire shearing process. These were then processed and edited for presentation within our 360-degree projection environment. The informative quality and immersive impact of this demonstrator were measured as a success by Prof. Reichel, and our IVE approach to virtual field trips to singular farming locations across the world will be able to play an important role in the School's future teaching regimen.

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Remake Confucian Rites

The “Remake Confucian Rites” project is a collaboration with Tsing Hua University (THU) in China and the Moonchu Foundation in Hong Kong. By means of innovative interactive design and advanced multimedia technologies, the achievement of digitally restoring the adult ceremony recorded in <I’Li> provides the highest levels of interpretive appreciation and heritage significance. Combined with a virtual model of a historical Confucian temple, the result of investigating the spirit of Chinese traditional ceremonial culture is regarded as both the research material and the foundation of Chinese traditional rituals.

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the Archery Ceremony


M4
X1
M5
G1
X2
M6
C4
F1
C3
03
C2

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VIVE

Panoramic Big Data Simulation for MTR Emergency Evacuation Scenarios

In collaboration with Prof. Kwok Leung Tsui at CityU Department of Systems Engineering and Engineering Management, a 360 big data simulation application was developed for MTR emergency evacuation scenarios. The user can control variables including the number of passengers to be evacuated in the MTR concourse, upper level platform, lower level platform and the trains, as well as the percentages of passengers for different available exits. This application can visualize the evacuation scenario, accompanied by a set of statistics generated from the simulation, including the total time of evacuation. This application also offers a top view of the evacuation process for the students to better understand the way in which the passengers navigate through the MTR station.

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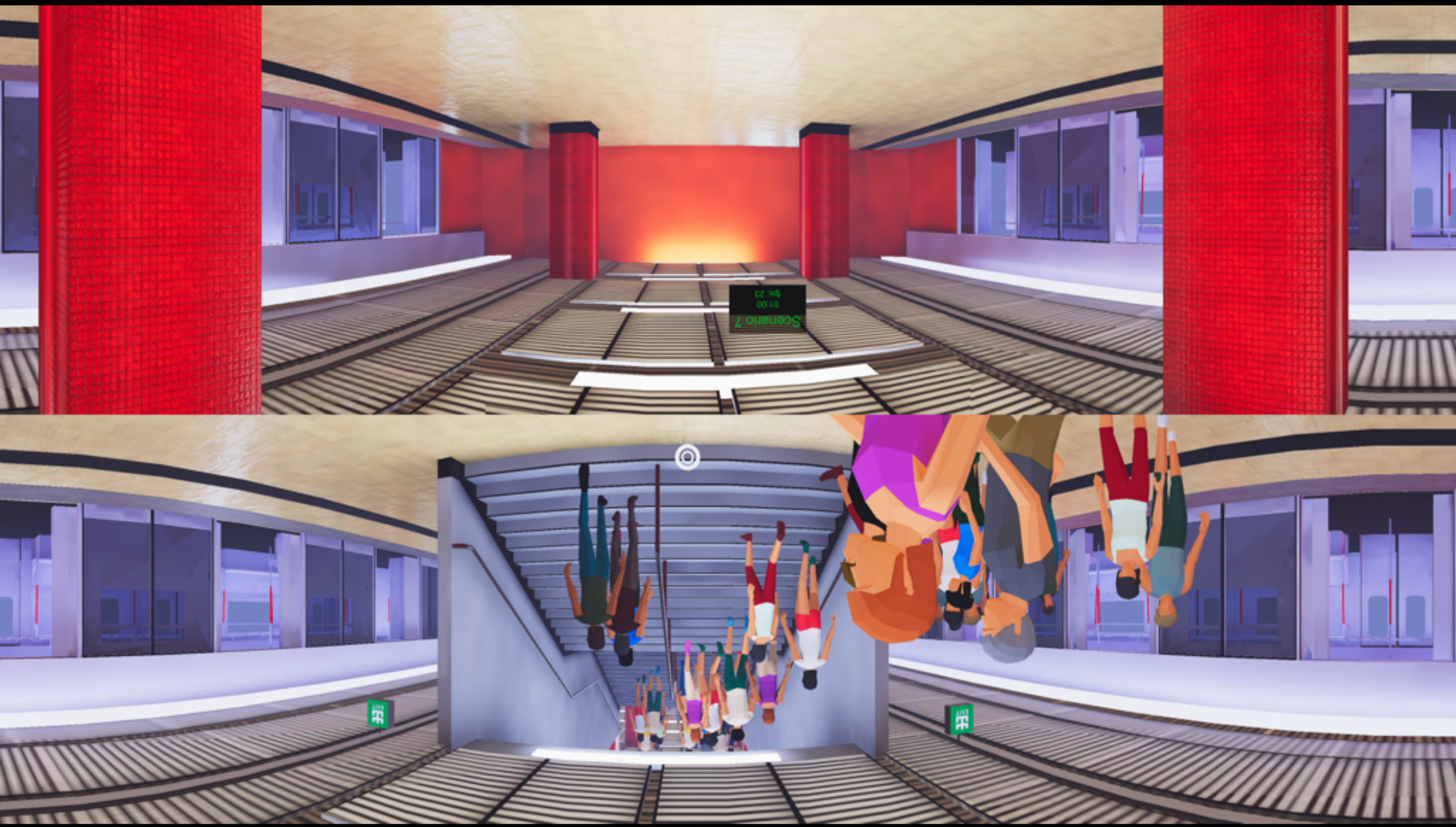
Scenario 7
00:40
fps: 22


Scenario 7
01:00
Apr 23


A
I
C
M
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nagement
EXIT
EXIT
Scenario 7
01:19
fps: 21
EXIT
C
E
EXIT
D
E
EXIT


Scenario 11
00:51
fps: 15
Statistics
people:
900
Time:
218s
790


Scenario 7
00:32
fps: 18


EXIT
Scenario 12
00:52
fps: 12
Concourse: 100 50
U/P: 400 200 100
L/P: 200 100
Cars: 400 200
E3: * Off 30% 70%
E6: ^ 20%
Go!

this page will be a video

Panoramic Blockchain Data Visualization

Working in partnership with Prof. J. Leon Zhao at CityU Department of Information Systems, we developed an application for 360 blockchain data visualization. With the complete transaction history of Bitcoin since 2009, this application offers a virtual environment for the user to navigate through the timeline of the transaction volume in a set period of time (per day, hour or minute), as well as the market price in USD, JPY and Bitcoin. As a teaching and learning tool, this application enables the user to demonstrate the development of Bitcoin, in order to identify potential risks and future trends up against major events throughout the history of this cryptocurrency.

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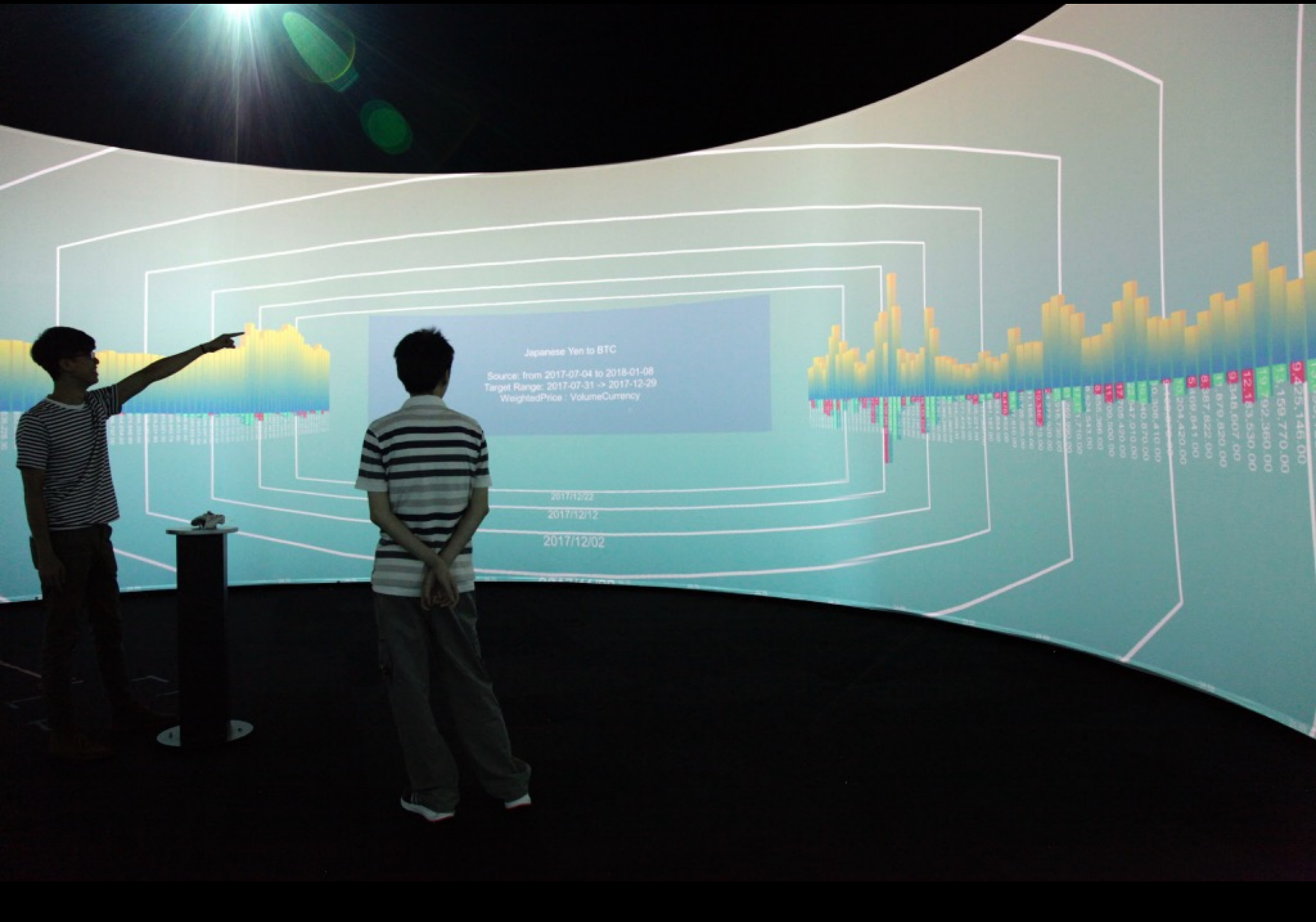
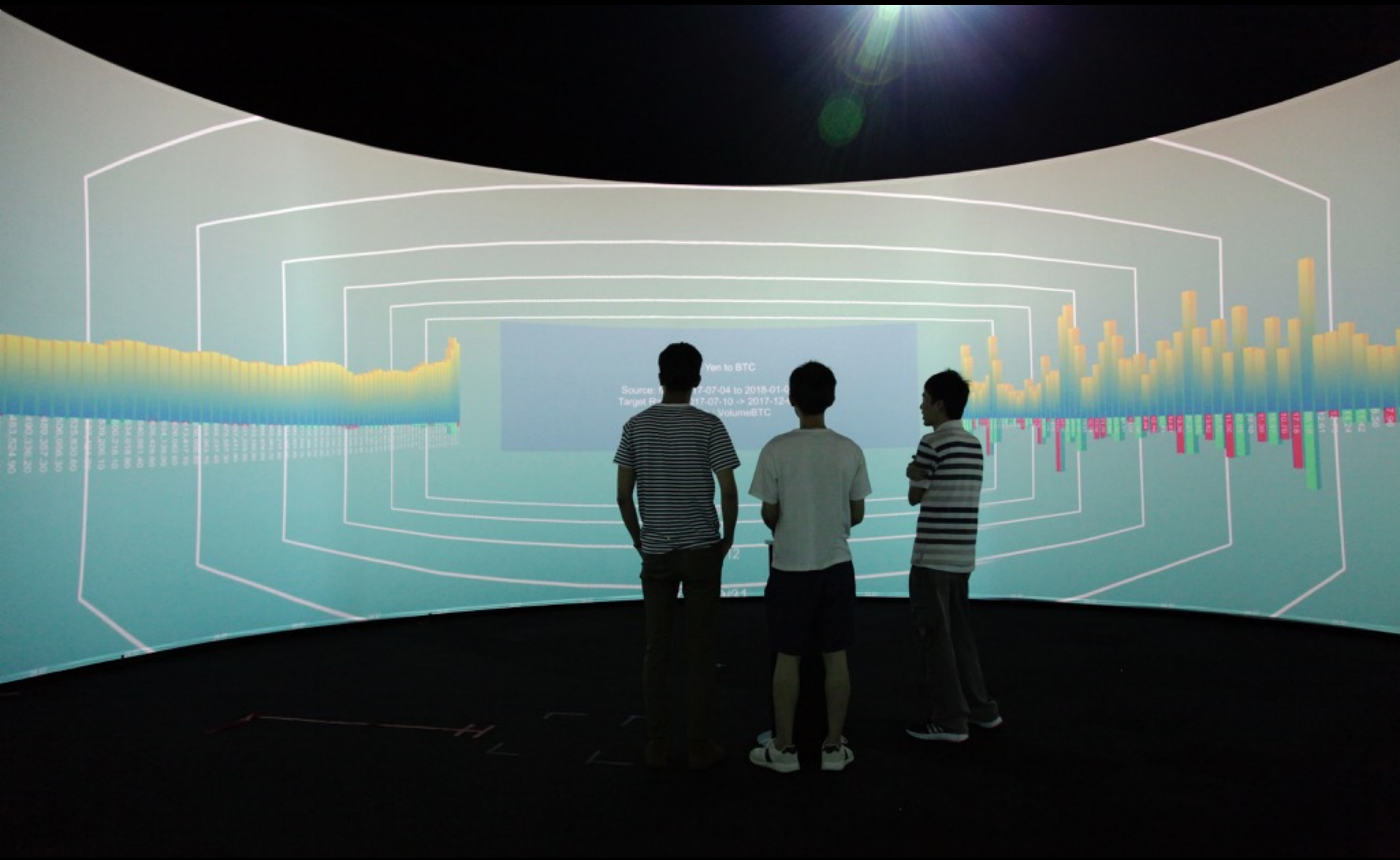
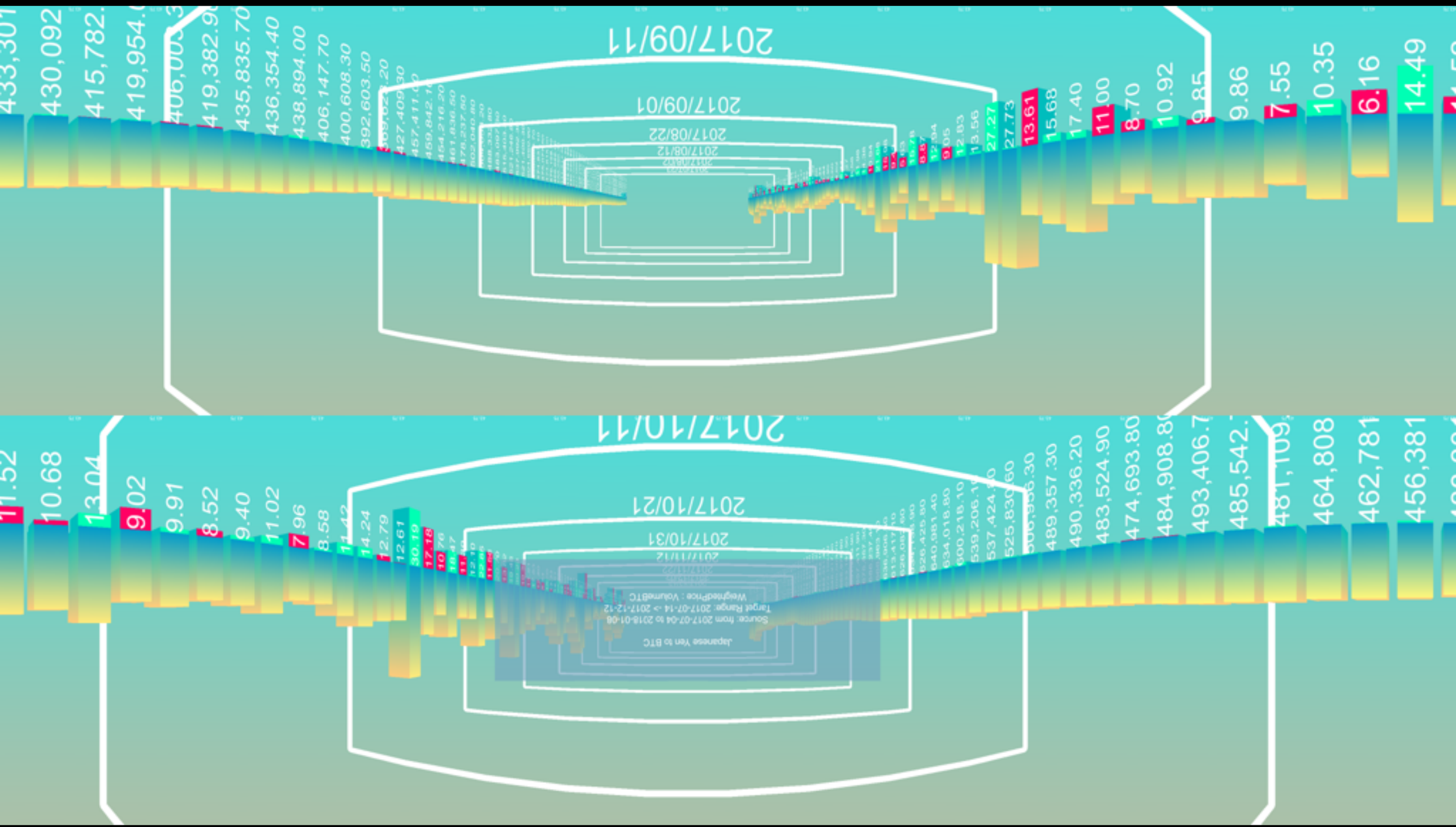
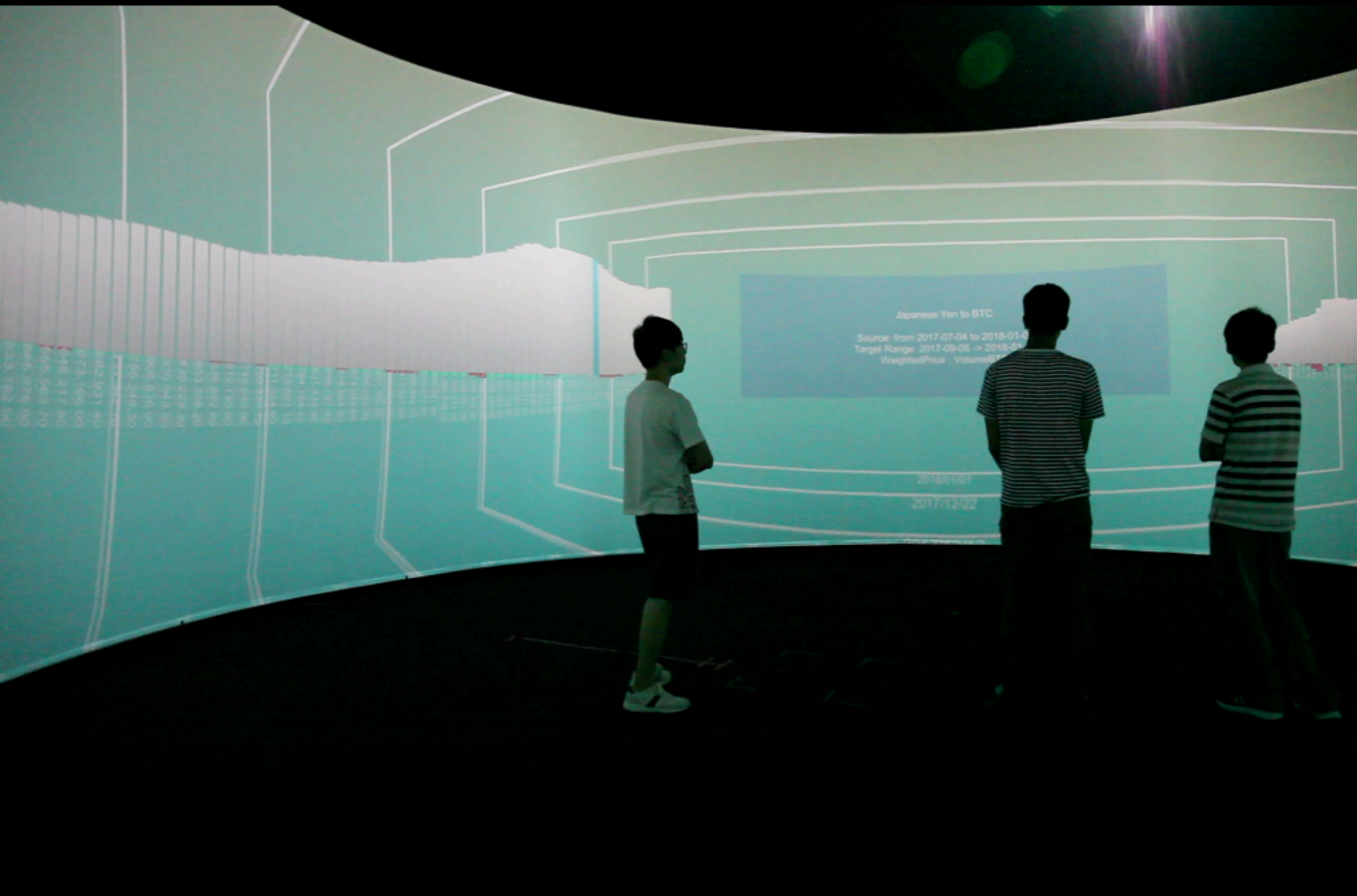

Japanese Yen to BTC
Source: from 2017-07-04 to 2018-01-08
Target Range: 2017-07-31 -> 2017-12-29
WeightedPrice : VolumeCurrency
2017/12/22
2017/12/12
2017/12/02


Yen to BTC
VolumeBTC


2017/09/11
2017/09/01
2017/08/22
2017/08/12
2017/10/11
2017/10/21
2017/10/31
Japanese Yen to BTC
Source: from 2017-07-04 to 2018-01-08
Target Range: 2017-07-14 -> 2017-12-12
WeightedPrice : VolumeBTC


Japanese Yen to BTC
2018/01/01
2017/12/22

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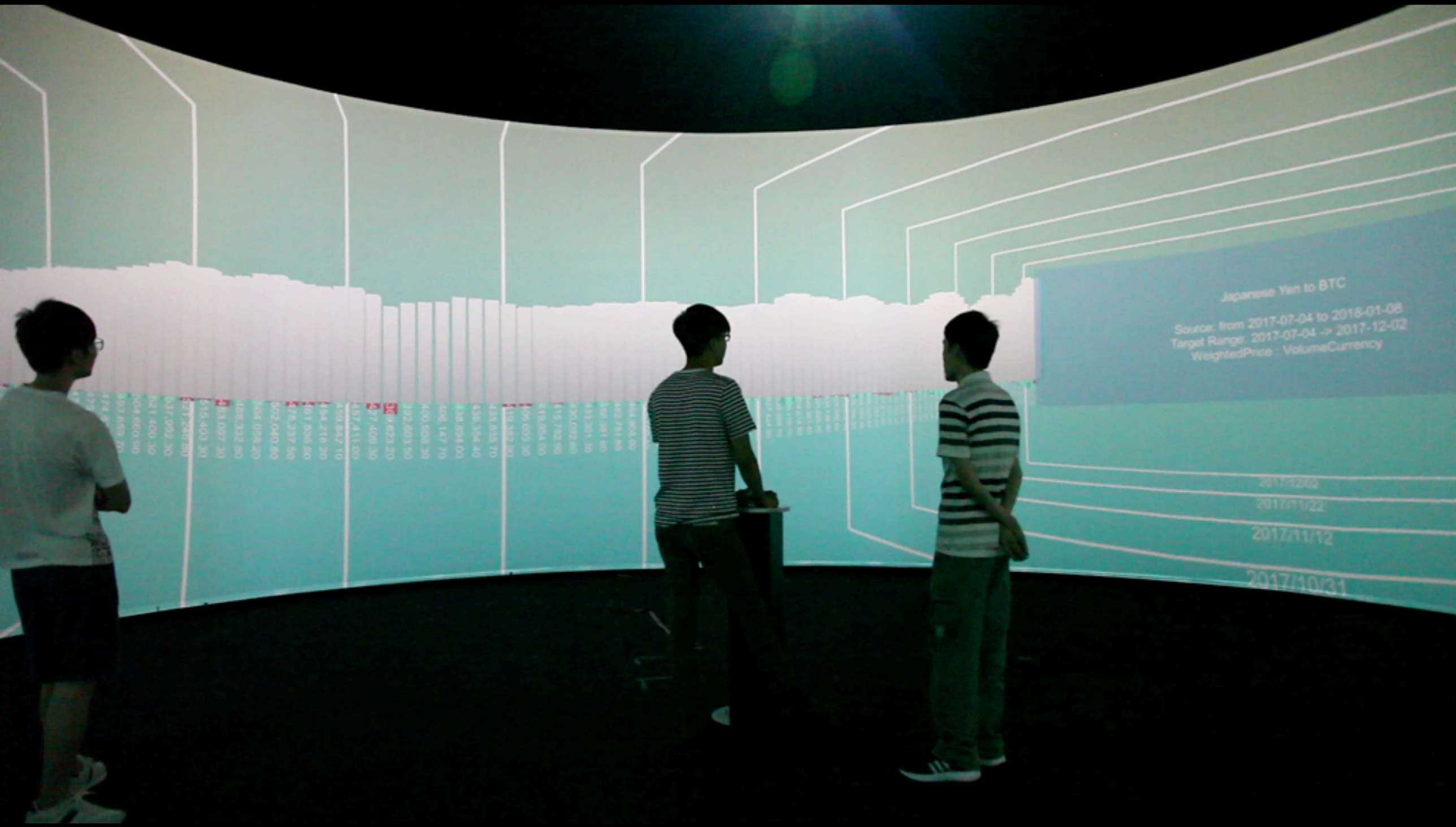

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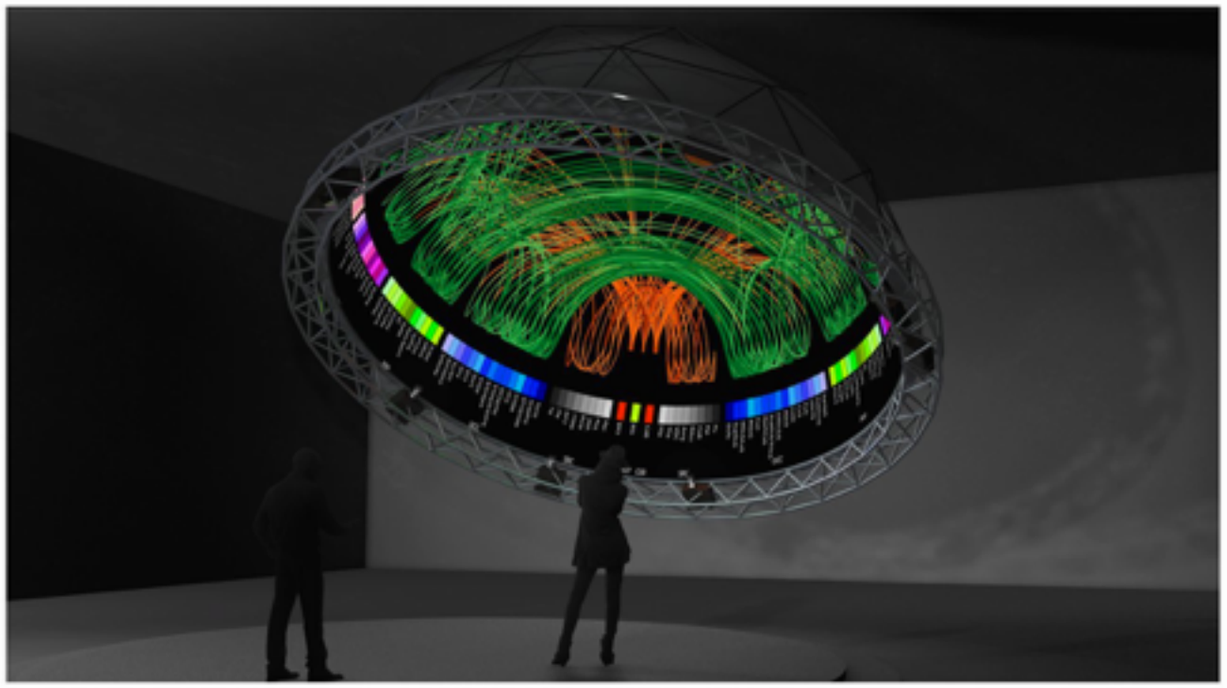
THE UNIVERSITY OF HONG KONG

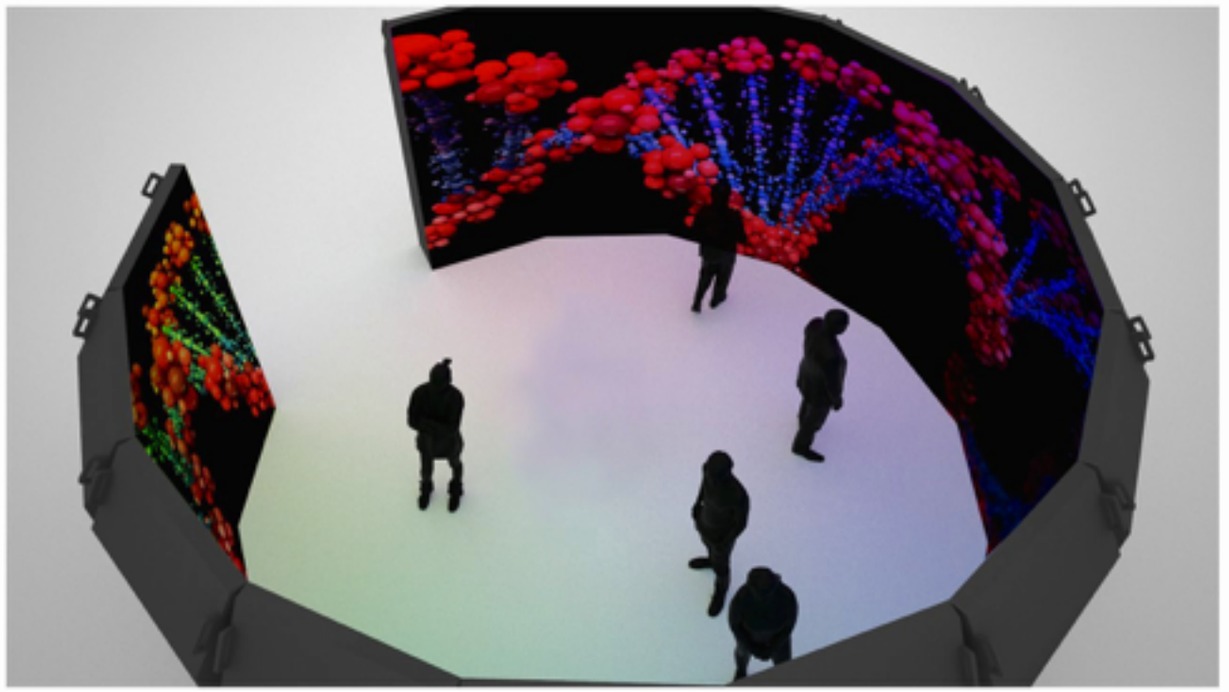
UNSW SYDNEY Art & Design

EPICENTRE: EXPANDED PERCEPTION & INTERACTION CENTRE



DomeLab

DomeLab is a six metre diameter 3D hemispheric projection environment (fulldome). DomeLab is a UNSW-led Australian Research Council funded project with collaborators across 11 organisations in Australia. The system is designed to travel both nationally and internationally.



EPIC 120

EPIC 120 system that is seven metres diameter, 340-degree panoramic projection, 33 speakers in a surround audio system, screen resolution of 120 million pixels in 3D, which is three times higher resolution than its nearest equivalent.

Panoramic Point Cloud Architectural Data Model Visualisation

In collaboration with Architectural Association Visiting School (Hong Kong), we developed an immersive 360 point cloud data visualization application for teaching and learning in Architectural Studies. Through photography, photogrammetry, and high-speed 3D laser scanning techniques, we captured the dense urban environments of Hong Kong, including Towngas Ma Tau Kok Control Centre, Chai Wan Cemetery, Tai Kwun - Centre for Heritage and Arts, etc. With the resulting 3D architectural data models, we developed interactive free-explore scenery and animations in Gallery360, in order to visualize the architectural data in the immersive digital platforms including panoramic projection environment and VR goggles. Within the immersive environment, the students are stimulated and encouraged to explore architectural design and application of material behaviour through innovation in combination with construction and critical re-articulation.

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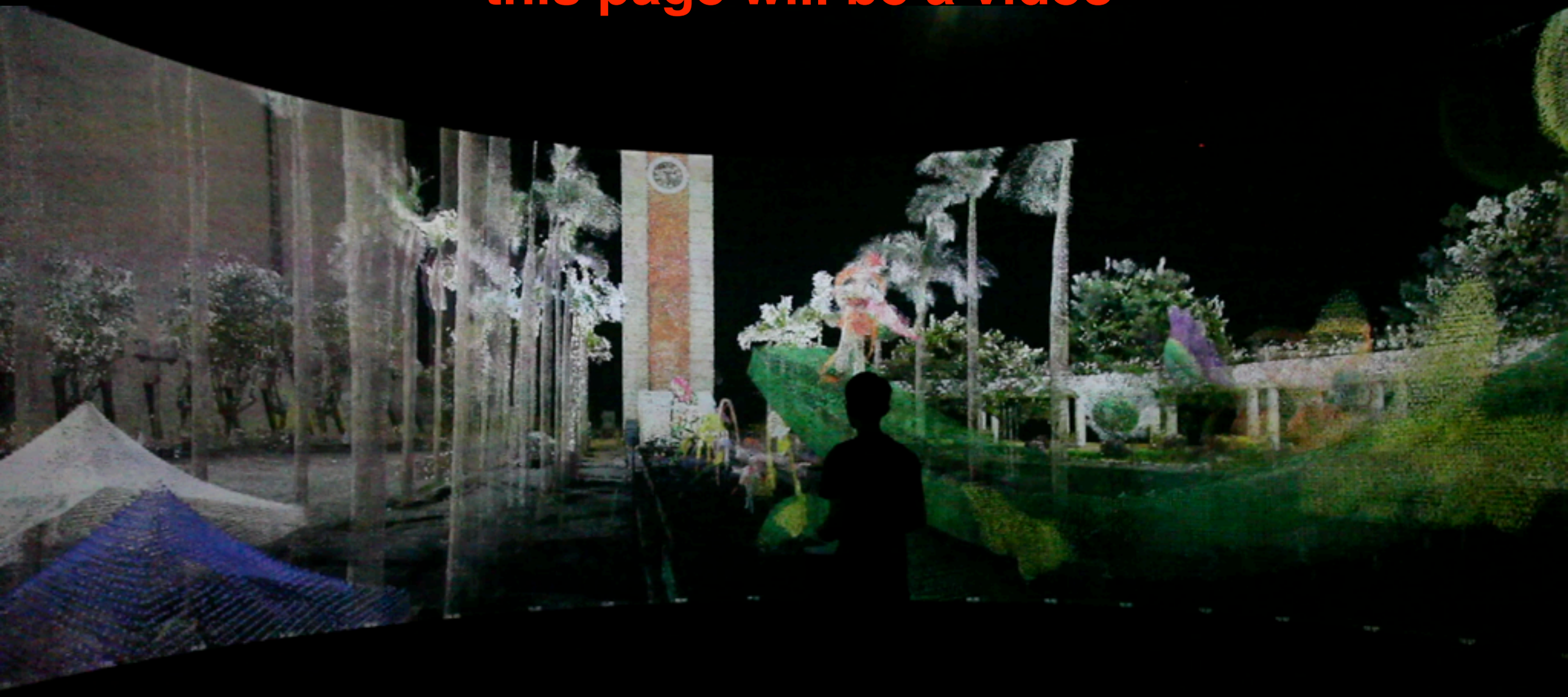

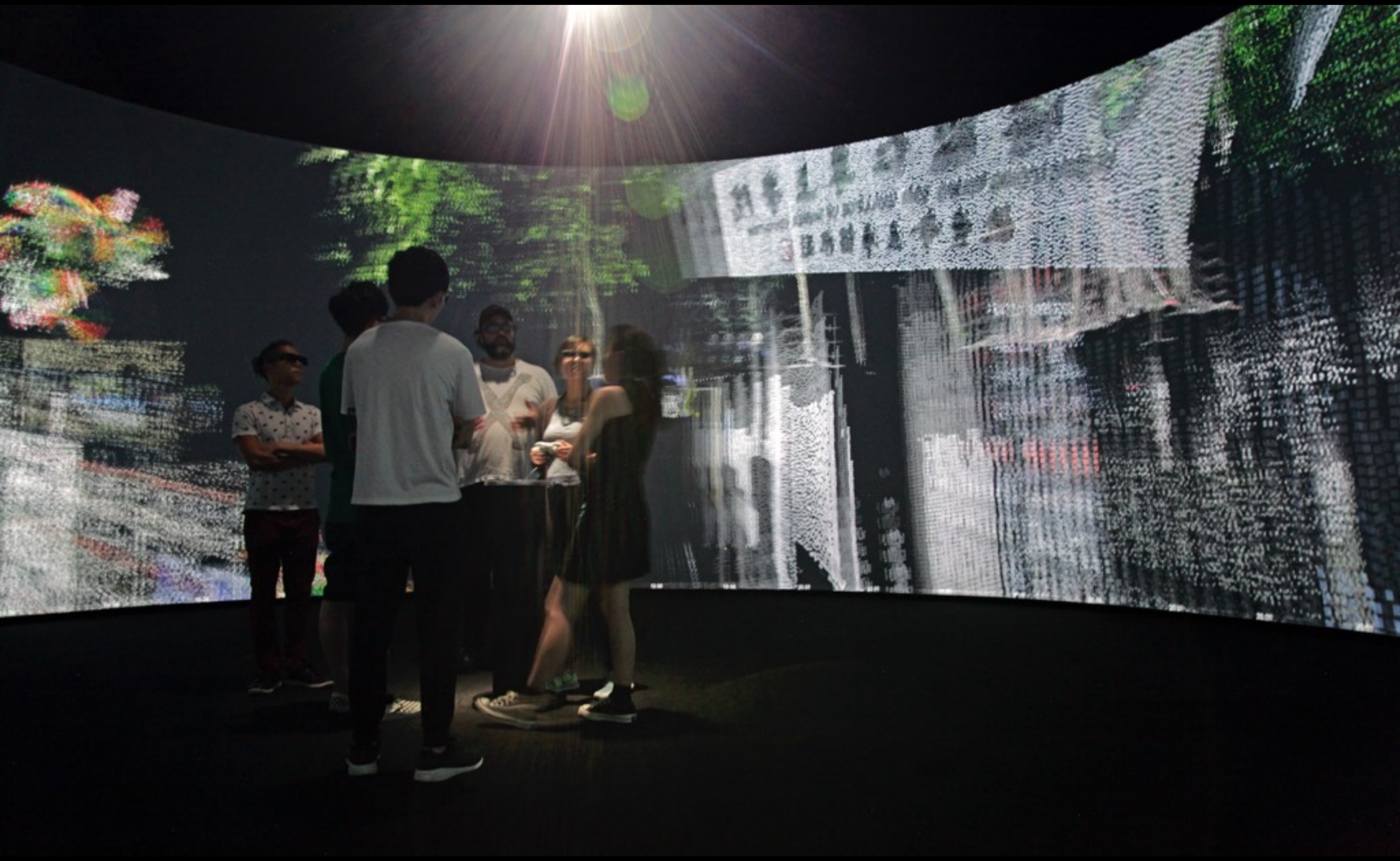

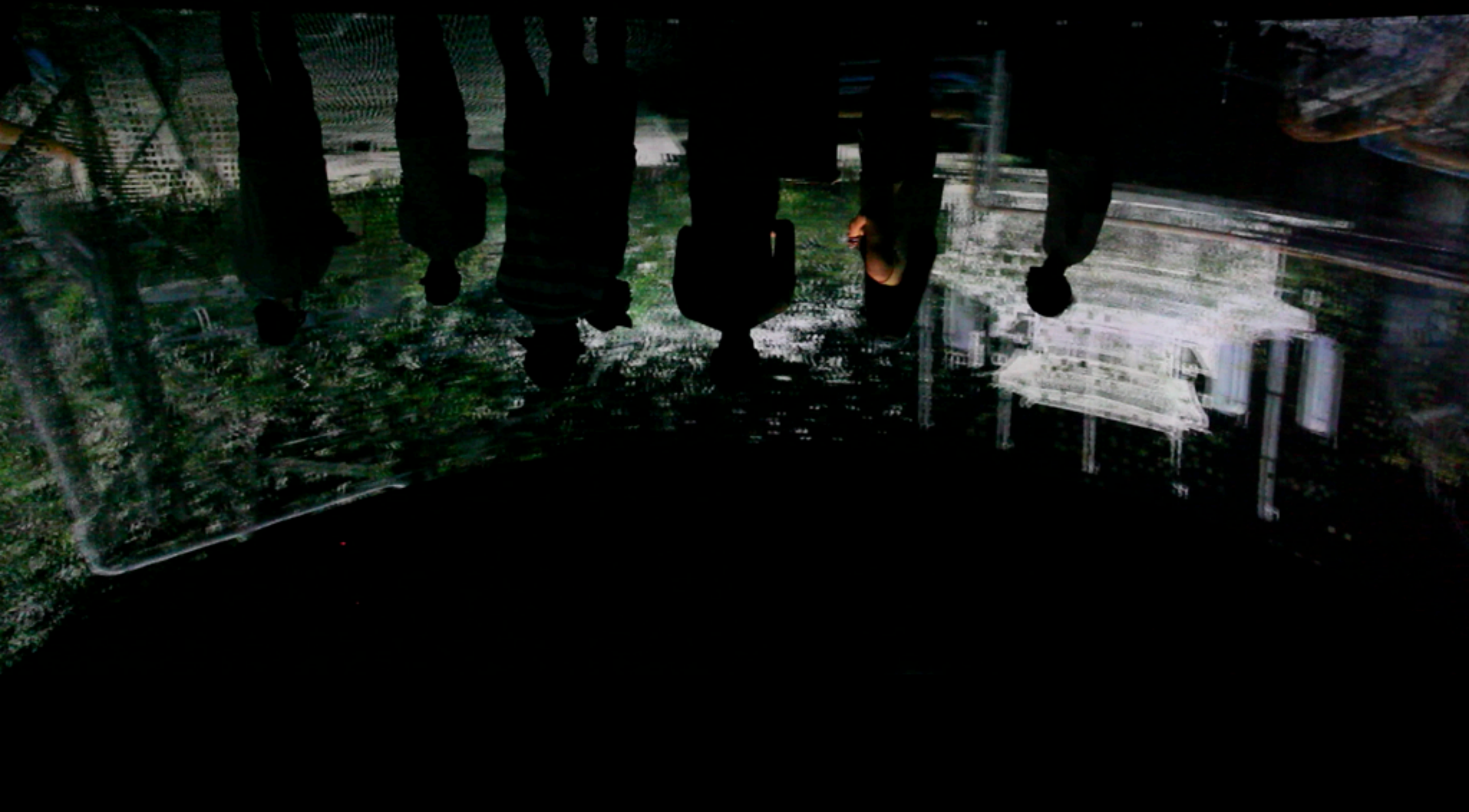

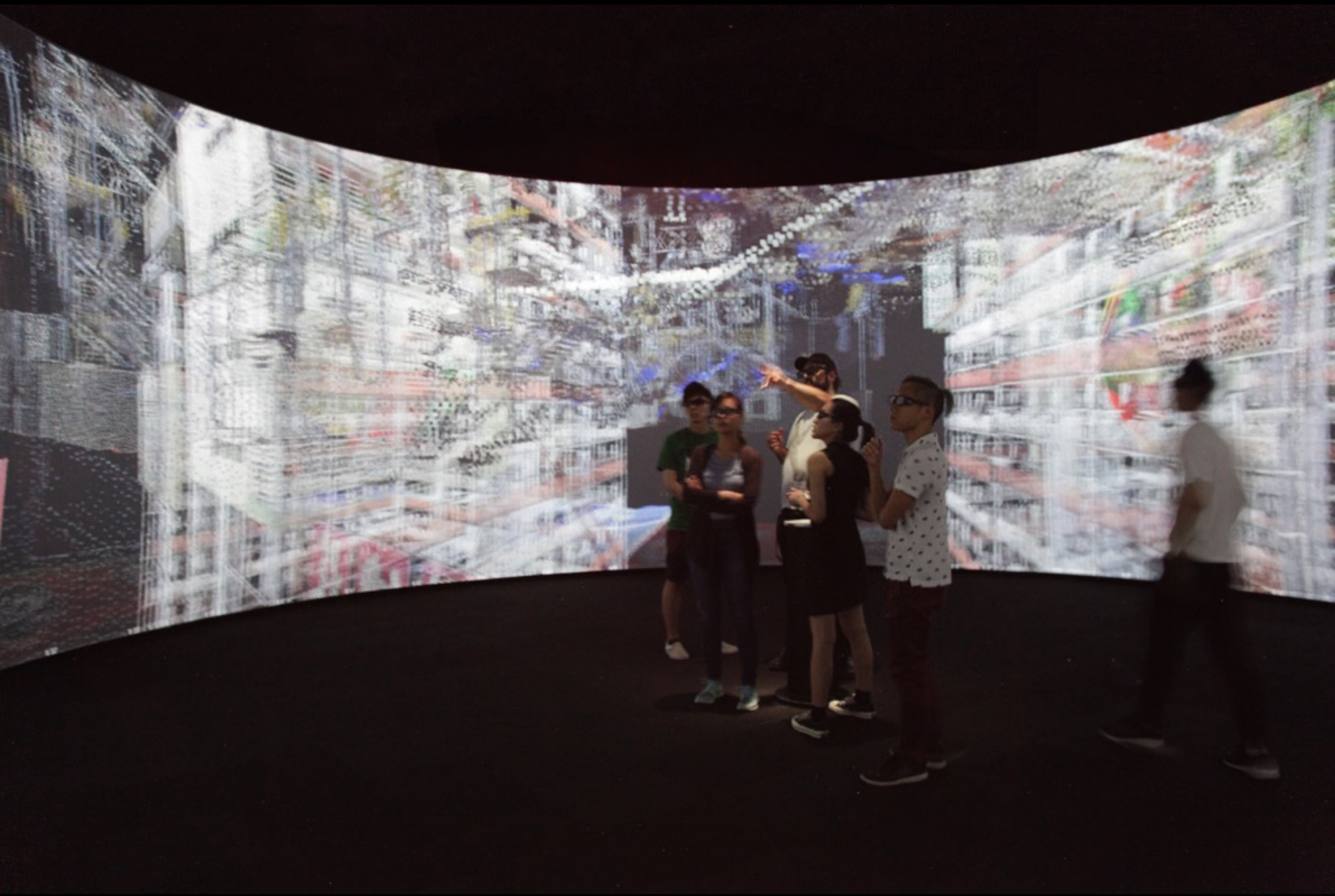

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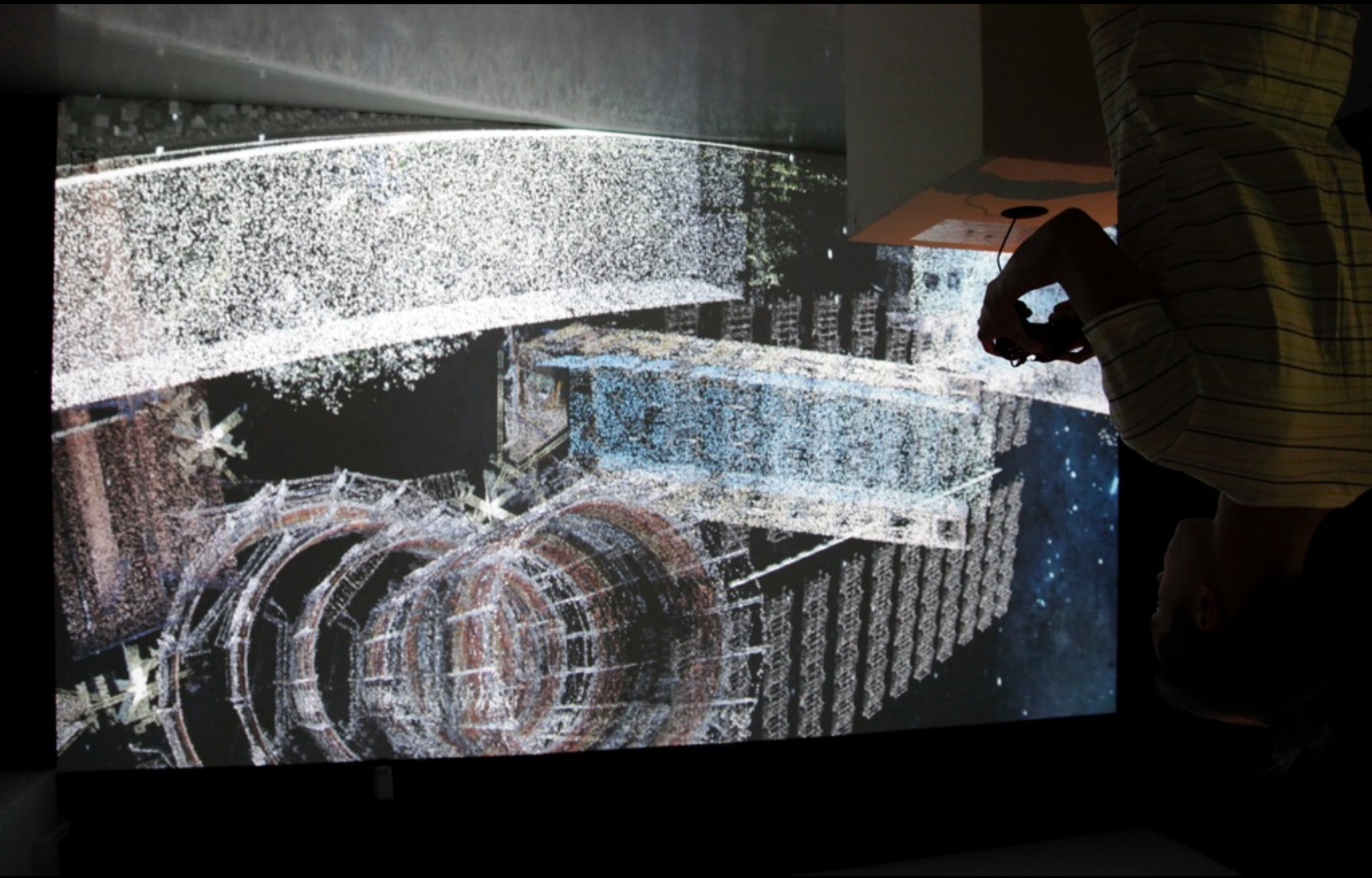

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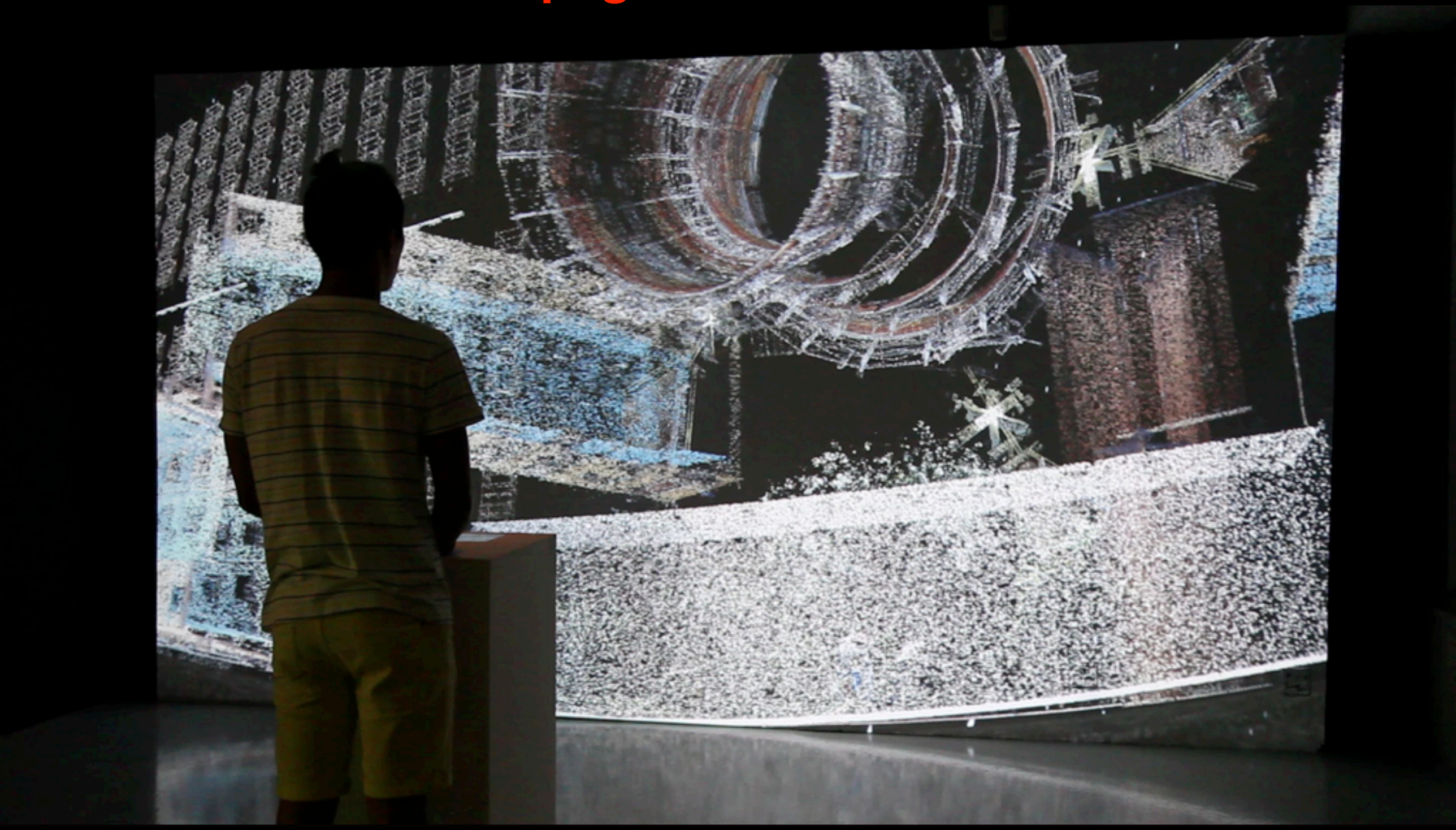

Tele-immersion for Teaching and Learning

Gallery360 distributed IVE real time connectivity via HARNET (The Hong Kong Academic and Research NETwork) was developed and implemented with HKU. Technicians at ACIM, CityU and HKU have developed a system platform that bridges IVEs in different locations, using the connective features of VR software Virtool and Unity. Having secured ultra-high-speed internet connection for the enormous data flow of real-time synchronisation between Gallery360 at CityU and imseCAVE at HKU, the system was successfully implemented to connect 35 students at CityU and 19 students at HKU to be in the same immersive virtual space for a Dunhuang Cave lesson by the same lecturer.

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HKU IMSE


Cave 103
Cave 196
Cave 220
Cave 46

(video of connection between CityU and HKU will be sent to you on Sunday)