Research Presentation: Augmented/Virtual Reality

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Personal Interests with Kinect

- Understanding that the Kinect is able to sense depth and even motion allows for a larger range of projects to create.

- I was always interested in creating projects that allow the audience to walk around and have new images scroll by as if they were immersed in that environment. In a way like a 360º image or a virtual reality.

Jeffrey Shaw - Artist

- Jeffrey Shaw is an artist who creates interactive art works. He studied Architecture and Art History at the University of Melbourne, Brera Academy, and at St Martin's School of Art.
- He taught at Media Arts at many universities.
- He also had a number of exhibitions that date from 1966 to the present.

Projects by Shaw

- ***Glove Screen, 1967:*** An array of gloves posted on a board. With a foot lever an inverse vacuum initiated and blew air into the gloves and appear as they are reaching out to you. A very early interactive project of Shaw that was installed in London.
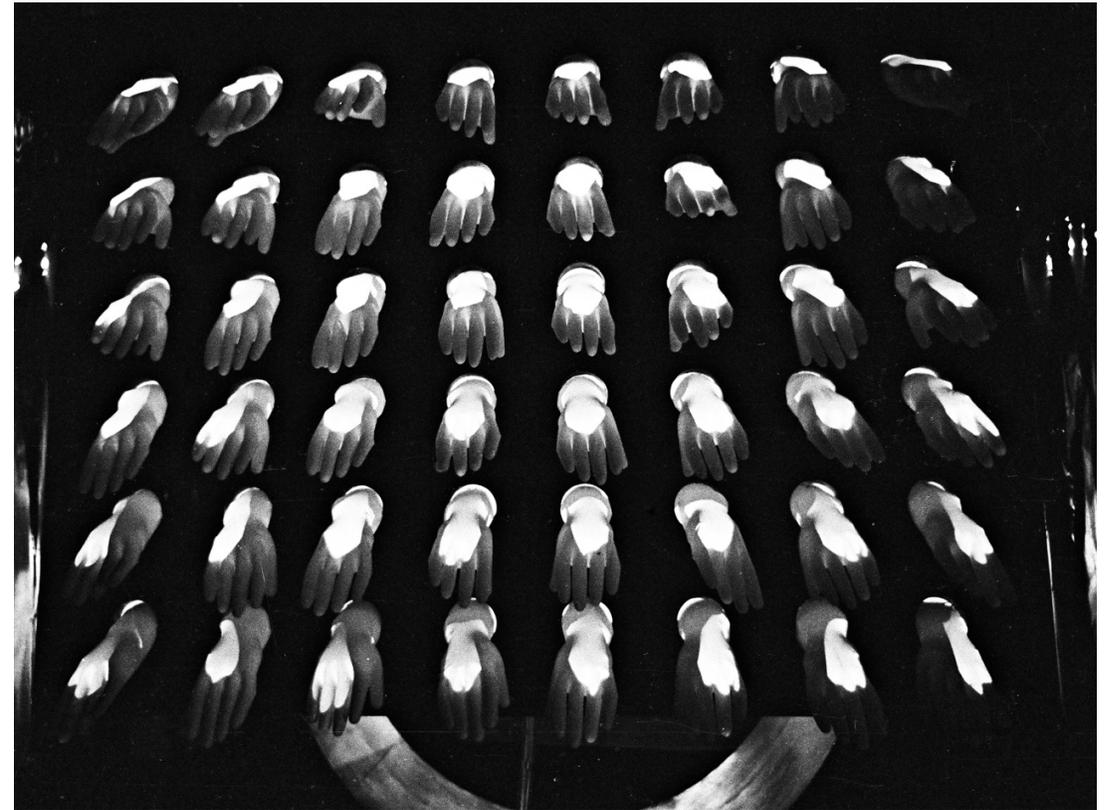
Projects by Shaw

- Jeffrey Shaw was very interested with tubes. He used them with many of his projects.

- *Supertube, 1968*

- *Pneutube, 1986*

- *Airground, 1968*

- *Sandquake, 1969*

- *Waterwalk Tube, 1970*

- *Waterquake, 1970*

- These were all interactive pieces by Shaw. They usually involved people entering the tube and walking around. They even allowed people to walk across on a lake (Waterwalk Tube).

New Media Projects by Shaw

- The first instance of use of augmented reality is in his project: ***Virtual Sculpture, 1981.***

- Using a semitransparent mirror and lenses Shaw projects shapes and other objects in real space.
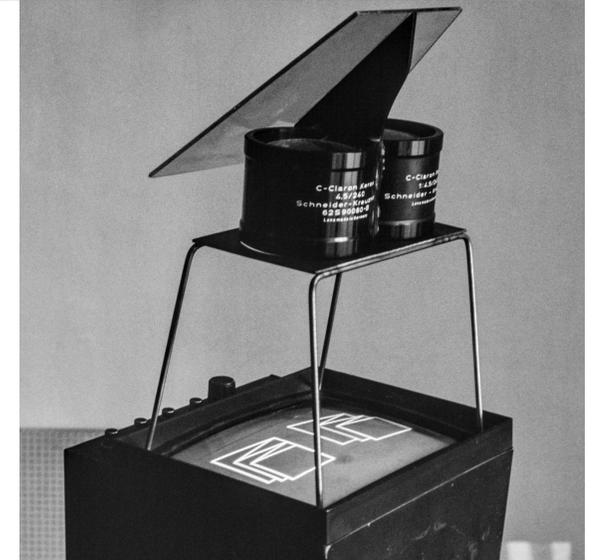
New Media Projects by Shaw

- Now in recent decades Shaw has continued created immersive and augmented works. Now with recent technology he is able to use new consoles and virtual reality headsets.

- Examples of projects:

- *Pure Land 360, 2012*

- *IN_SIDE View, 2016*
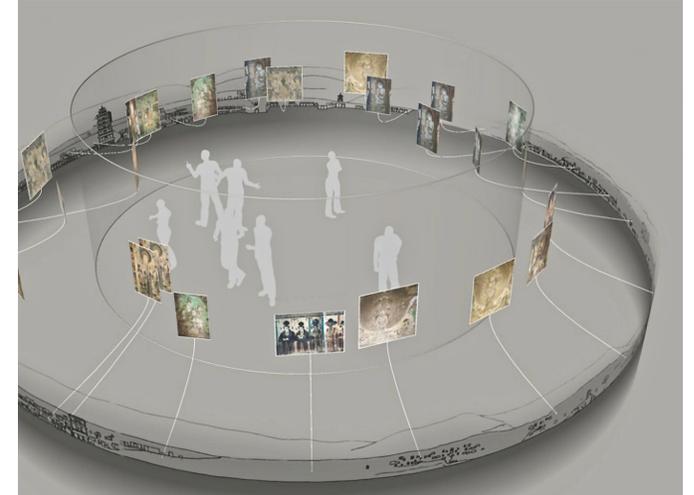
Engineering Paper:
A realistic Augmented Reality Racing Game using a Depth-Sensing Camera

- This research paper was written by Adrian Clark and Thammathip Piumsomboon.

- They are both researcher at the Human Interface Technology (HIT) Lab at New Zealand.

- This paper focuses on their augmented reality racing game using the kinect

Engineering Paper

- This project used the kinect camera, OpenNI library, OPIRA and Surf library to complete the project.

- Another rgb camera is used for viewing as shown in the image.

Engineering Paper

- The kinect camera then calculates depth using point cloud and creates 3D data

- The group later used an augmented reality (AR) application to develop a virtual car. This car was made to interact with real world objects

- As you can see the car interacts with the paper as a ramp, the book, and the user's hand.

Engineering Paper

- To make this game realistic they used another library to add realistic physics.

- The name of the library is called Bullet. This gives the car properties such as: tire friction, engine and breaking forces, and suspension. Other properties include gravity and collision detection.

- Here we see the wire frame mesh from the AR application representing height. As you can see the car is falling on the bottom right indicating the implementation of physical properties to the game.