3D Object Reconstruction and Visualization using Kinect and Cardboard

Paige Hinkle, Jon Lee, Siena McFetridge, Rohan Ramchand, Jaime Rivera (Group 7)

Objective and Key Results

- Create a 3D mesh of an object using Microsoft Kinect
  - Rotate the object using a lazy Susan
  - Create a 3D object from the Kinect's data

Objective and Key Results

- Create a 3D mesh of a scene using Microsoft Kinect
  - Rotate the Kinect
  - Create a 3D scene from the Kinect

Objective and Key Results

- Display the 3D mesh in Google Cardboard for virtual reality viewing
  - Use a web harness to display the object
  - Rotate mesh using phone movements

Results

Creating a Mesh

Using the Kinect

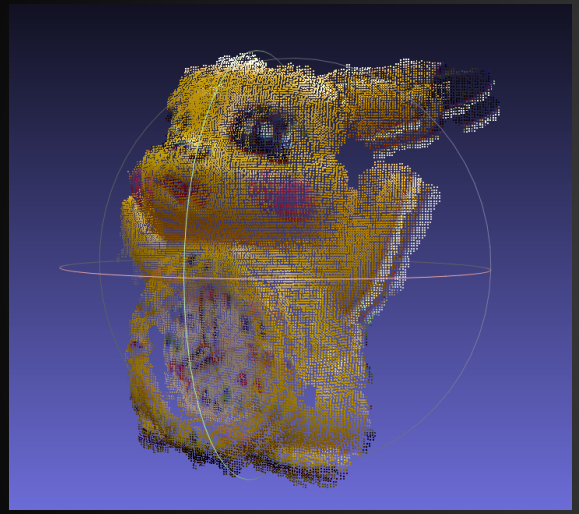
Object Rotation

Creating a Mesh

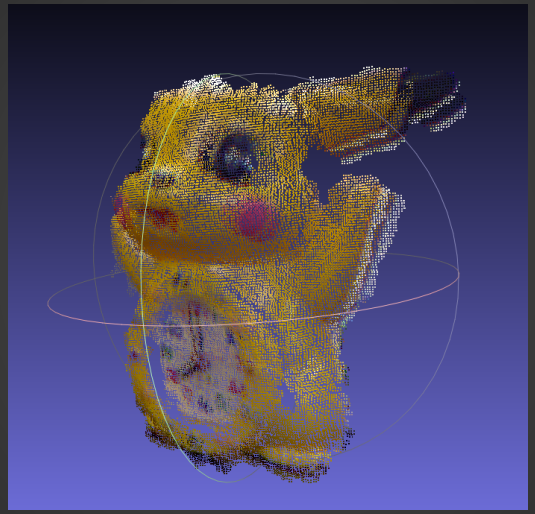
Mapping the Point Clouds together

Feature Matching

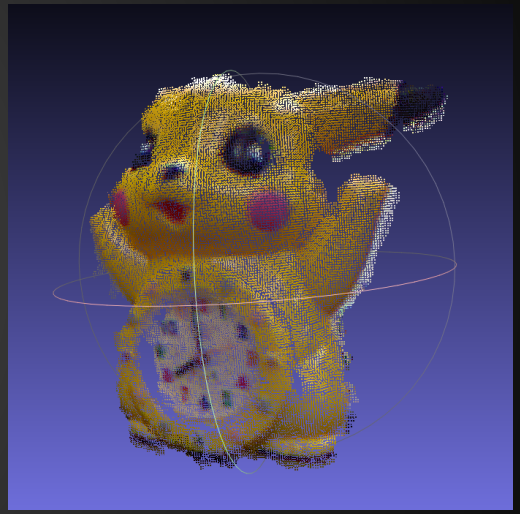
Iterative Closest Point



1 iteration



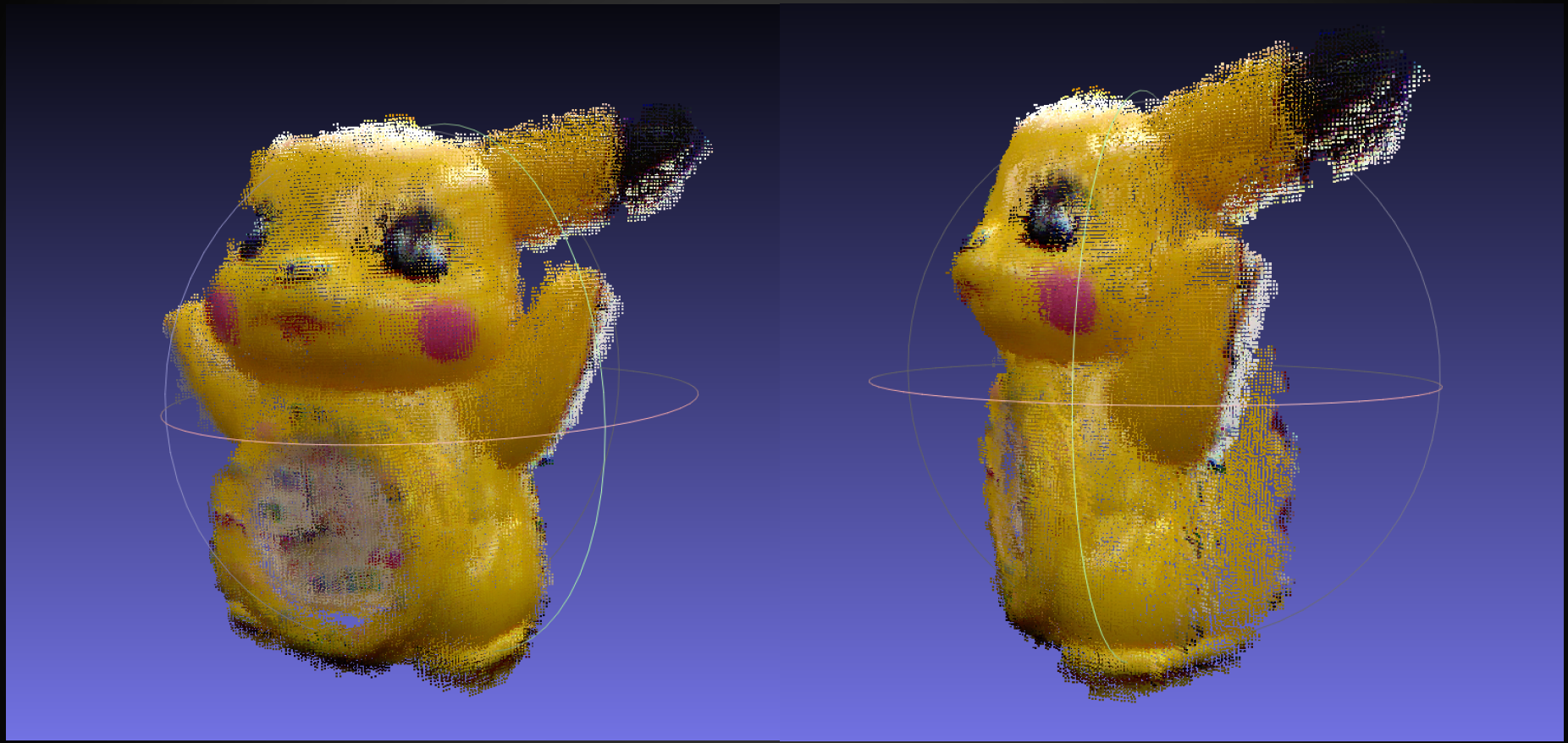
5 iterations



15 iterations

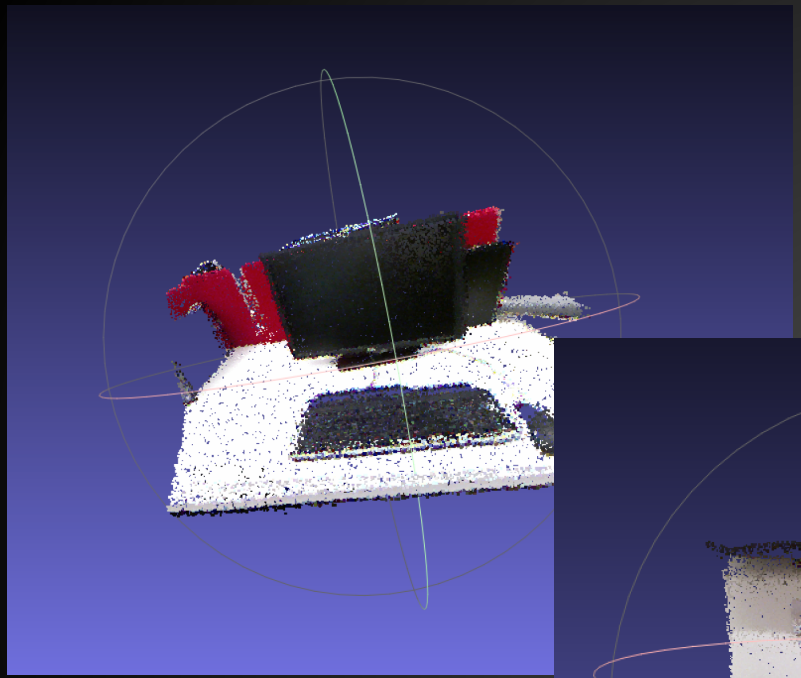
Creating a Mesh

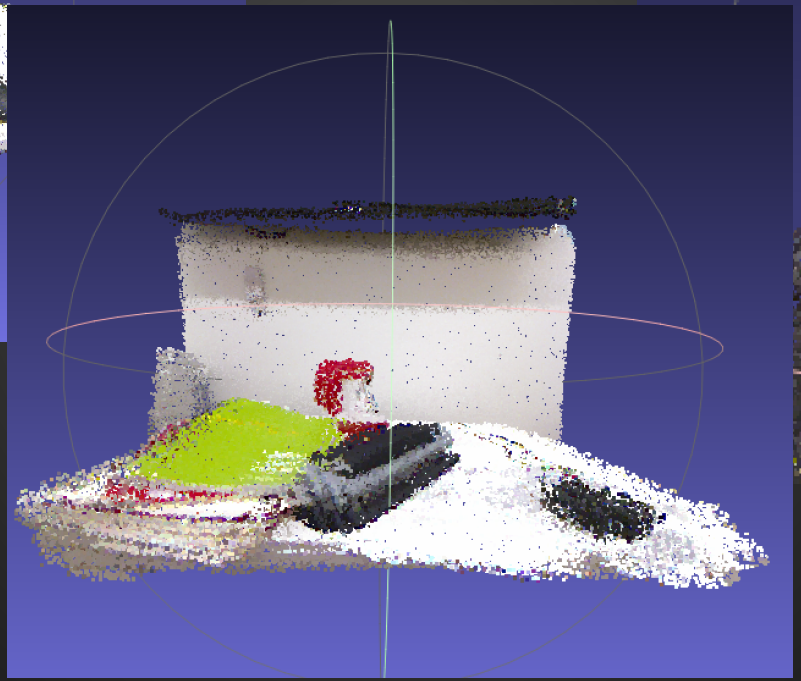
The Final Product

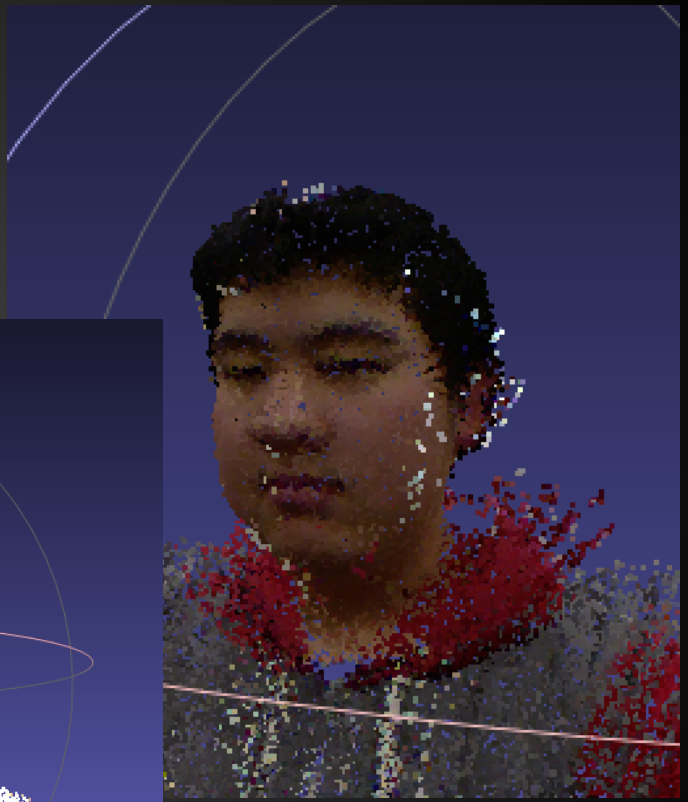


Creating a Mesh

The Unexpected Product



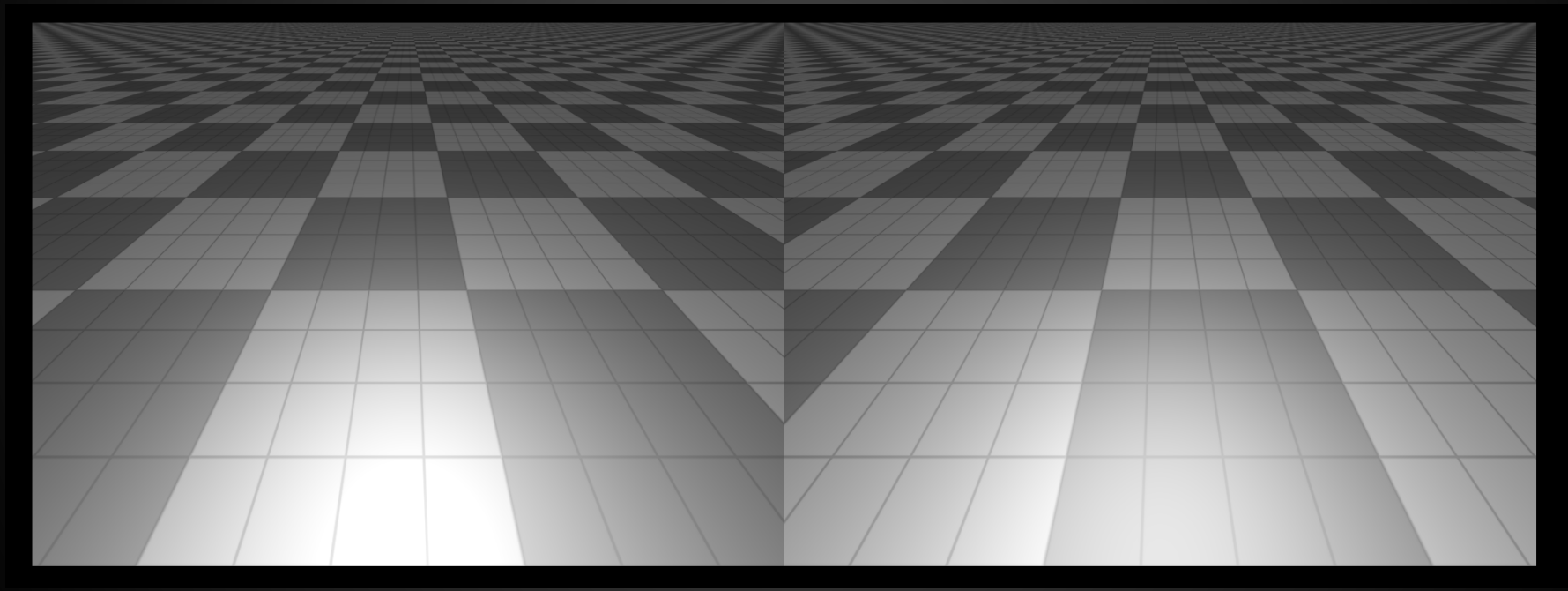




Viewing on Cardboard

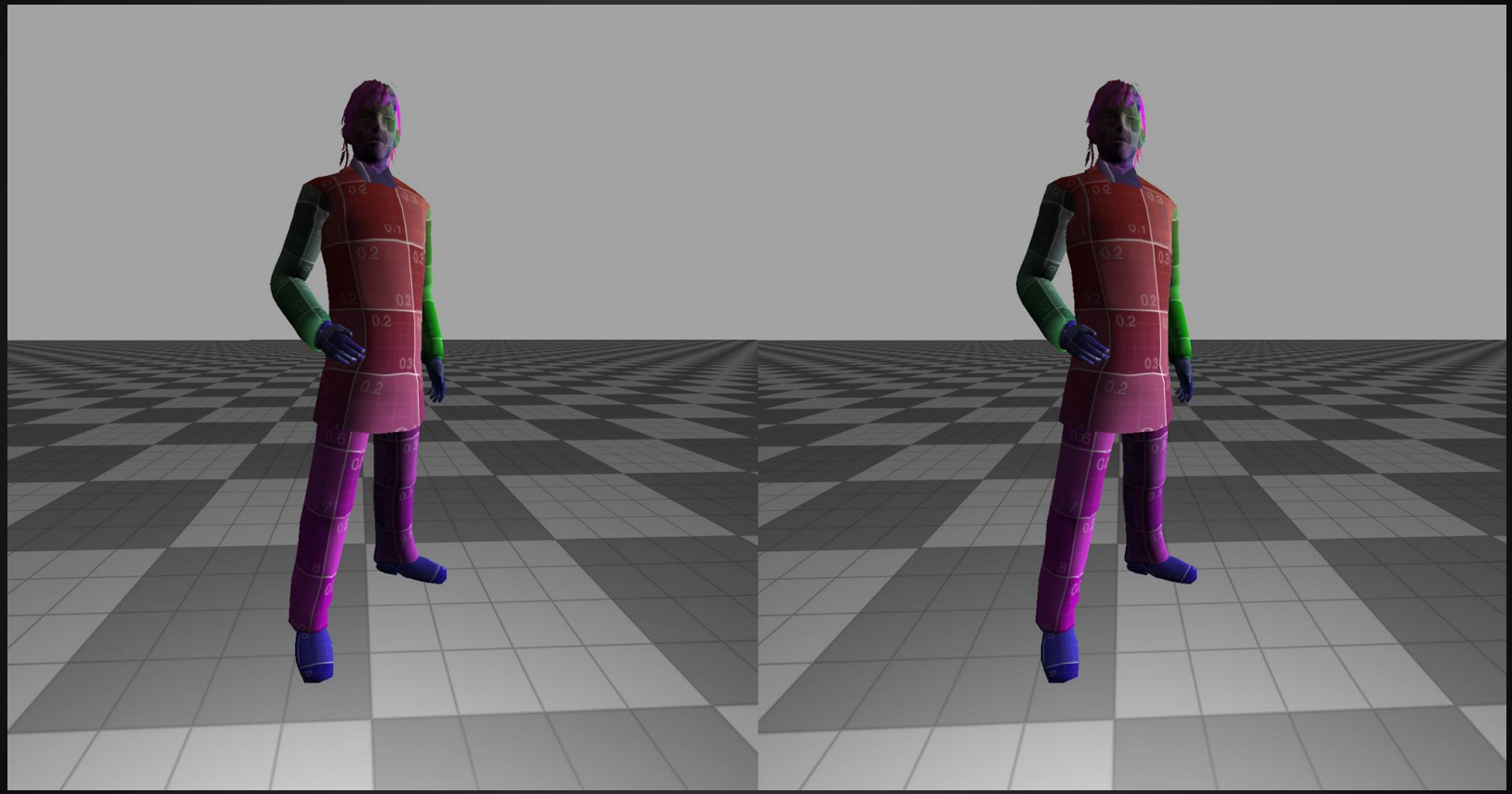
Setting up the Harness

Virtual Reality Offset



Viewing on Cardboard

Viewing a Point Cloud or Object



DEMO

Obstacles and Challenges

Linear Algebra

Quick Point Matching

Kinect 2.0

Small oversights can set you back

Documentation

Cardboard has limited documentation

Time

Not able to complete OKR 2

Questions?