



Applications of Augmented Reality Project Demonstrations EN.601.453/653

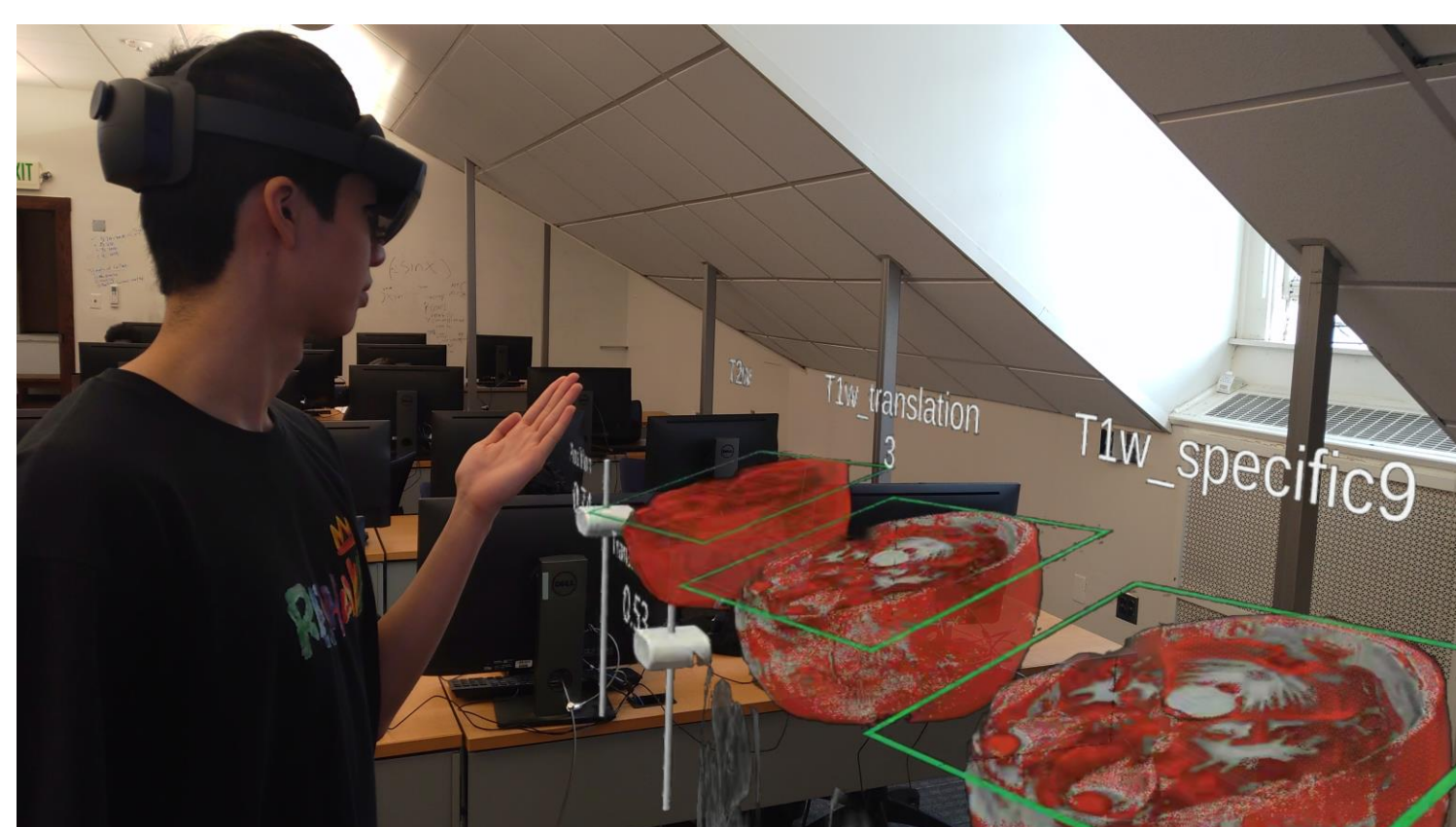
Thursday, May 11th, 9:00-12:00, Hackerman Hall – Room 320

Instructor: Alejandro Martin Gomez

Teaching/Class Assistants: Sing Chun Lee, An Chi Chen, Yihao Liu

Robotics and Medical Applications

Assessment of MRI Registration with Augmented Reality



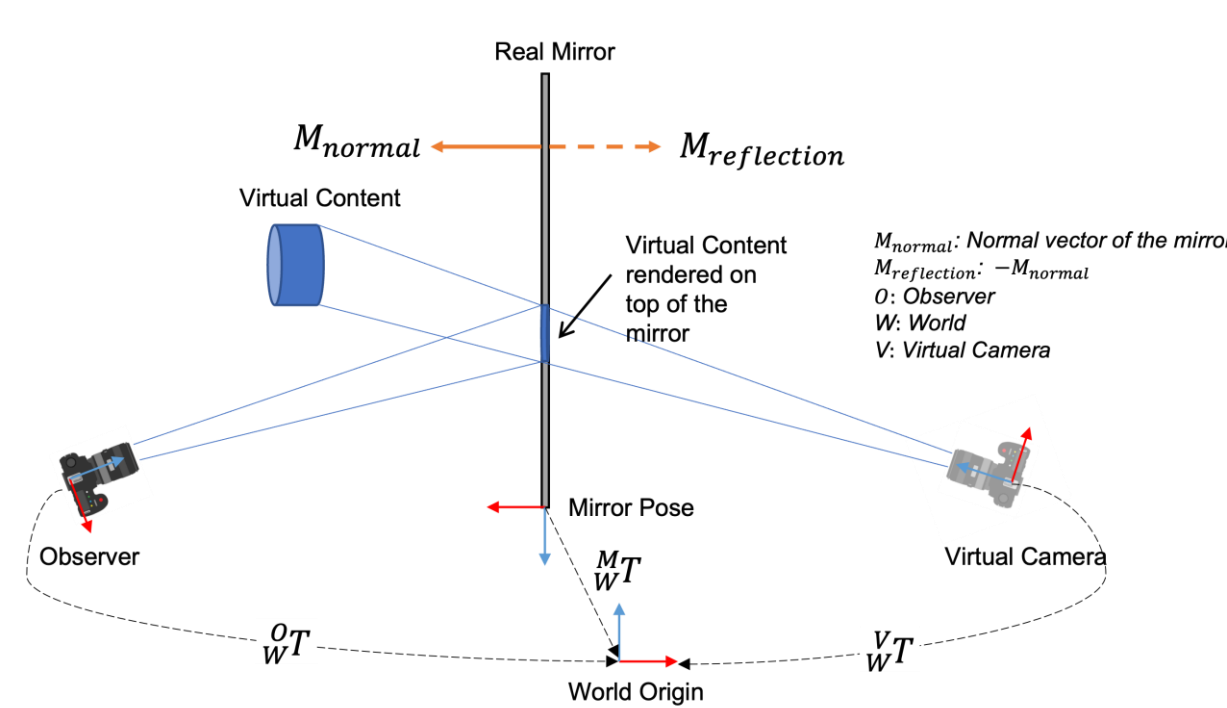
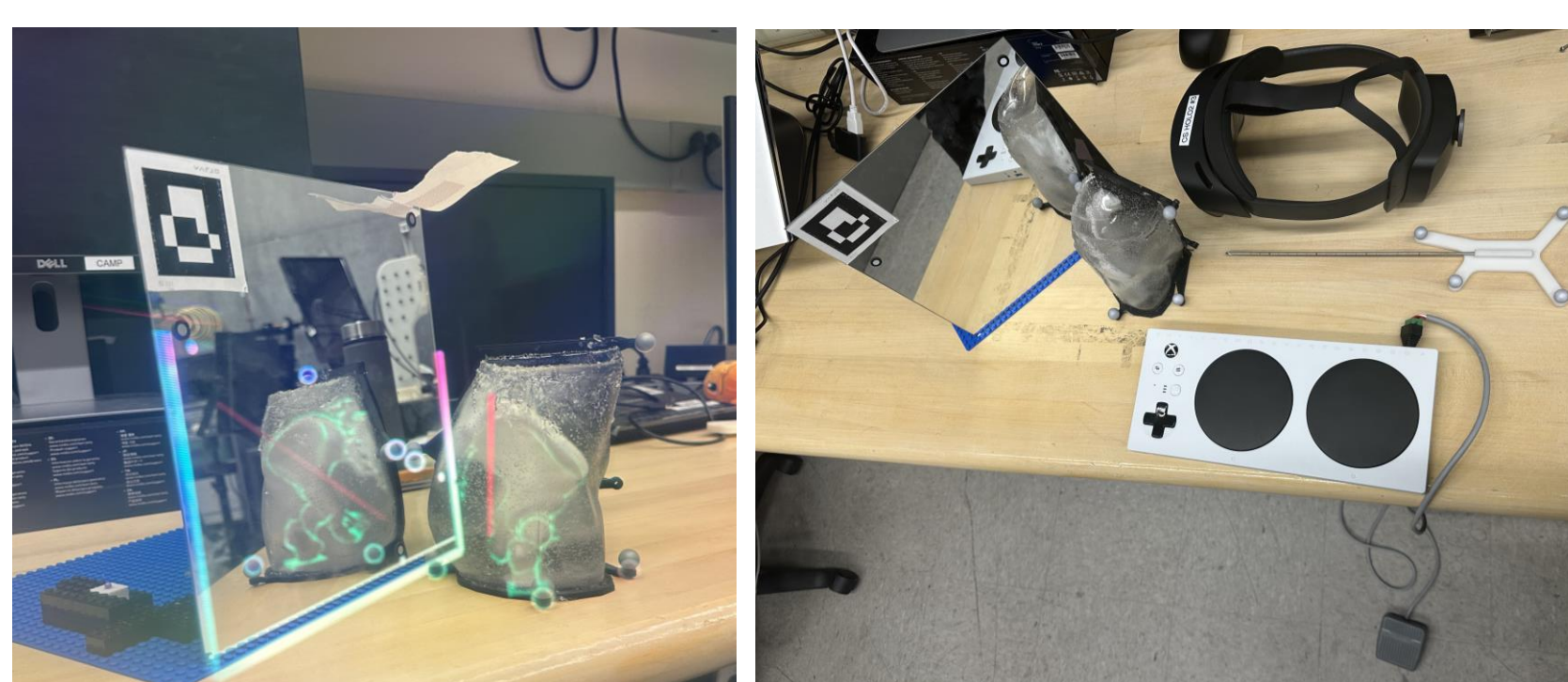
File Import UI and Model Activation

Editor Window for 3D Volume Data

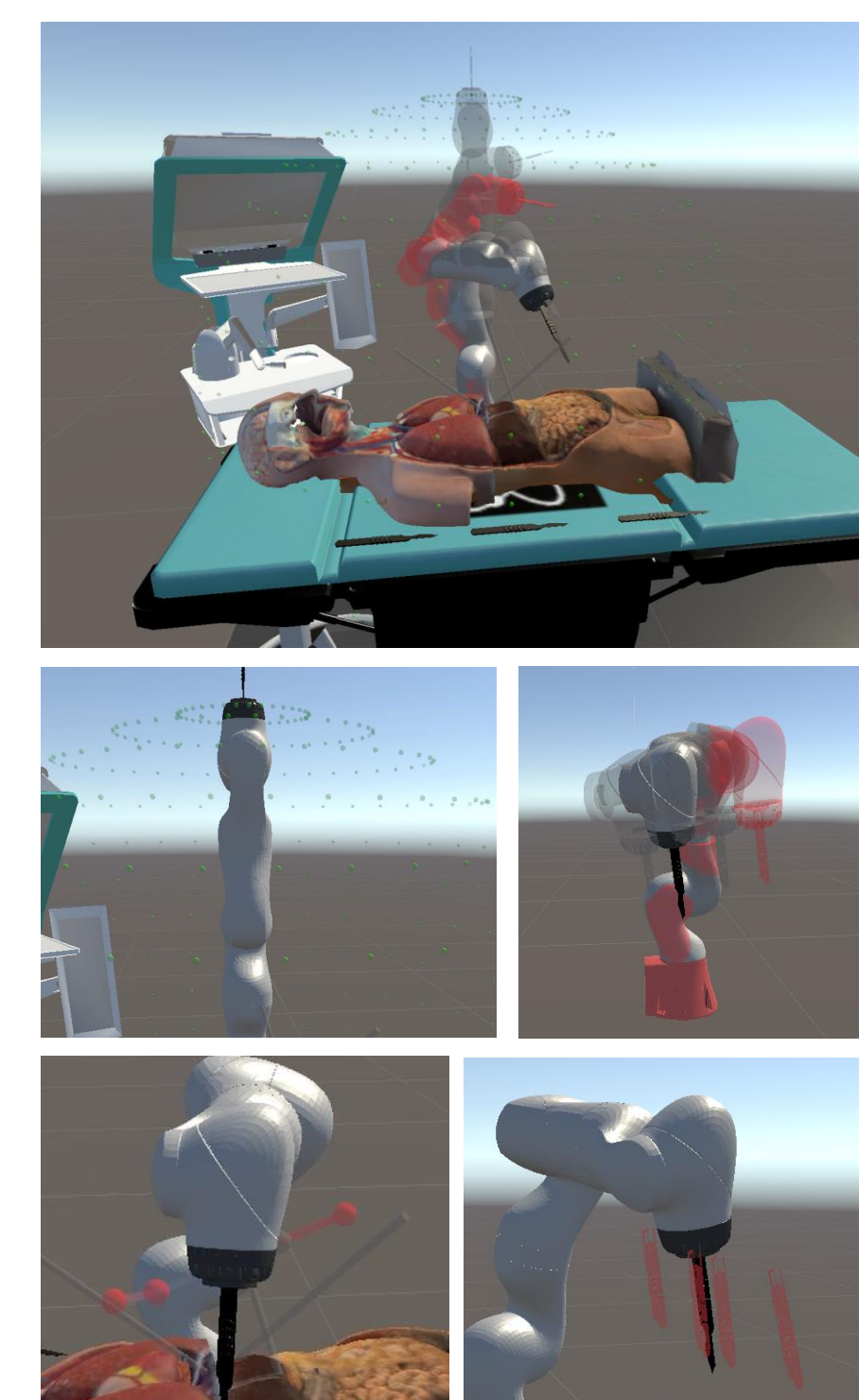
Assessment UI (core features)

- Gesture control & Speech commands
- Adjust the transformation (position, rotation, scale) of slicing plane
- Adjust the transparency of slicing plane
- Overlap 3D models and slicing planes
- Reset models to the default transformation

Augmented Mirrors for Medical Applications in Orthopedics



Visualization of Robot Interaction Space in Robot-Assisted Surgery



Human-Computer Interaction

Repurposing HMD's Built-in Sensors to Increase Users' Awareness

Ready to collect data

Ready to collect data

Ready to collect data

HoloLens image sensors

- depth camera
- short and long throw IR illuminators
- 4 gray scale cameras
- color video camera

Motion 94°

Color 30°-60°

Shape 5°-30°

Text 5°-10°

Gaze Direction

Creating Novel 3D User Interaction Devices for Augmented Reality

- Rotation
- Translation
- Slicing
- Opacity

Use the index and middle fingers to select the sets for interaction. The highlighted one shows your current selection. Rotate your hand to interact with the object. Use your ring finger to freeze the position of the object if you want to explore your work.

Previous Axis Freeze

Next Axis Freeze

Main Menu

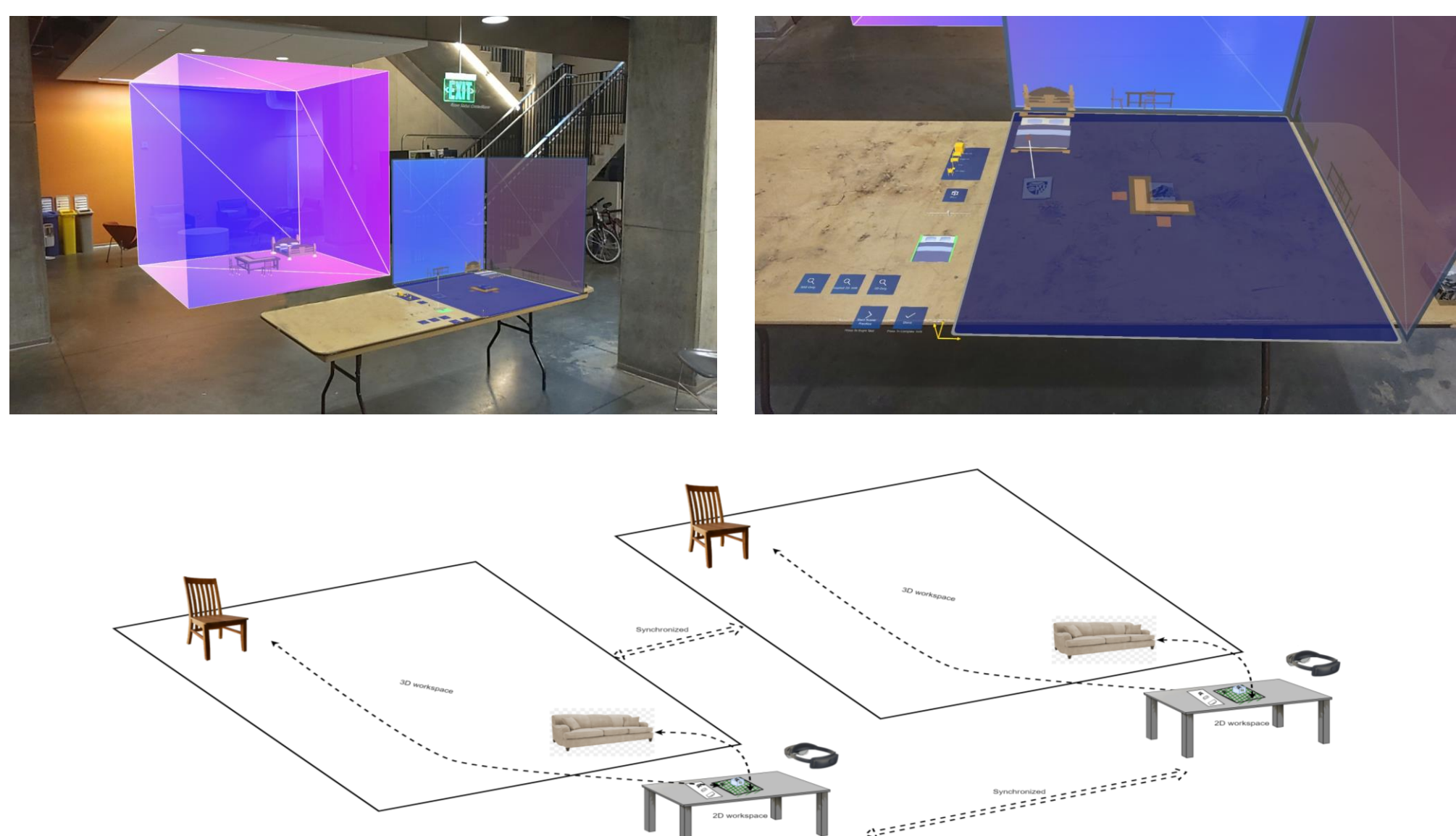
(a) Bloom

(b) Click

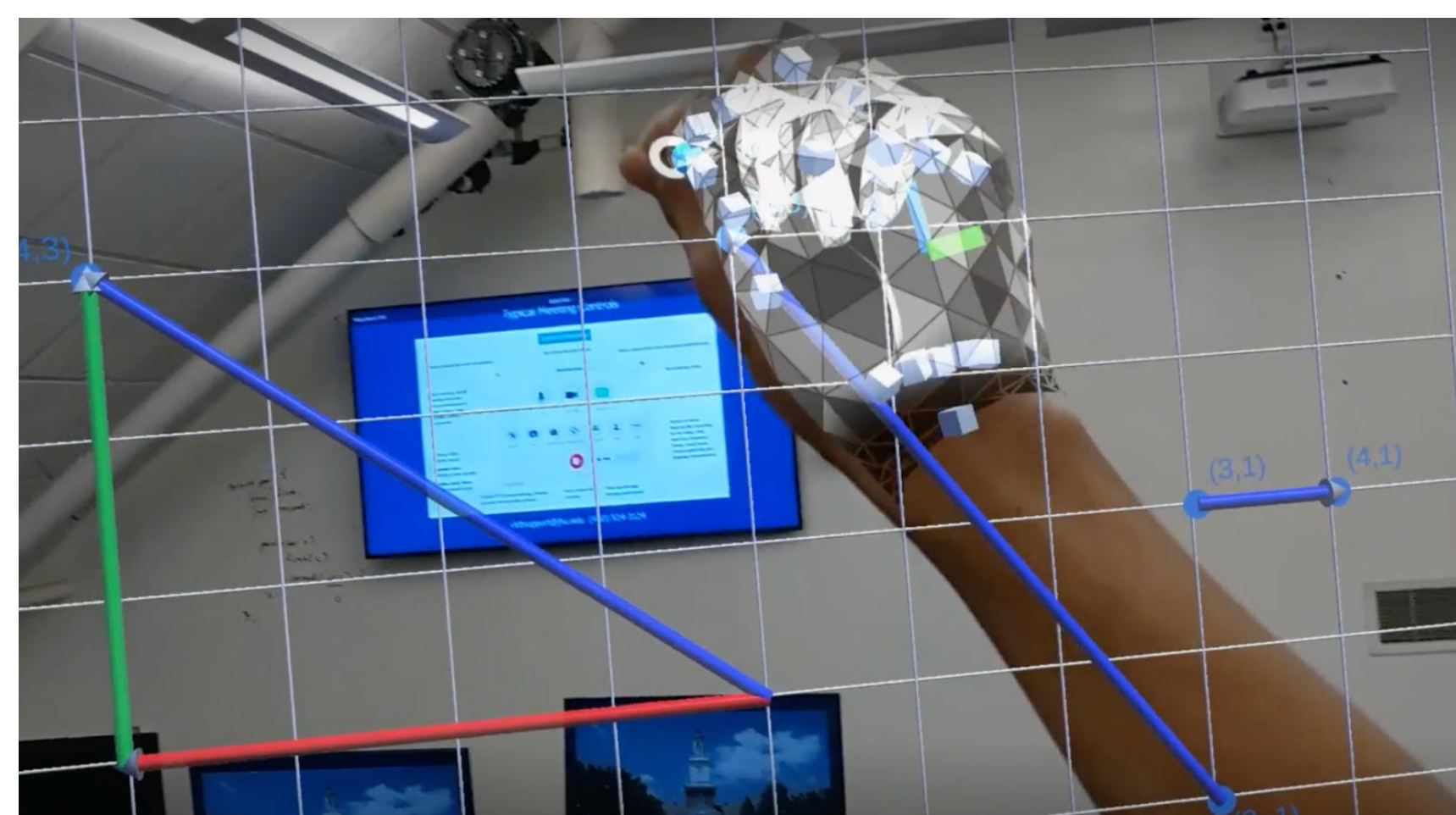
(c) Zoom-in

(d) Zoom-out

LayAR: Collaborative Layout Using Augmented Reality



Teaching and Education



Learning Linear Algebra with Augmented Reality

