

# Mixed Reality in Hands-On Learning of Robotics

Xinyan Zhao (CSE), Sabrina Lam (MAE), M. Usman M. Bhutta (MAE), Darwin Lau (MAE), Jimmy Lee (CSE)

## Introduction and Motivation:

**Augmented Reality**

- Digital information is overlaid onto the actual physical world.
- Interactions between the virtual object with the physical world.

**Robot Experiment**

Problems: Cost too much

- Human talent.
- Time.
- Space.
- Money.

**Solve Robot Experiment Problems**

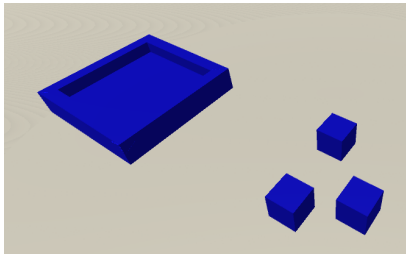
Simulation ≠ Reality

- Errors.
- Frictions.
- Power.

## AR with Robots:

### Virtual Scenes

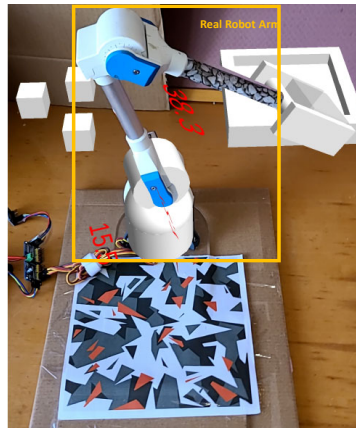
Virtual scenes that will be augmented onto the real world.



Different Objects In Specific Position

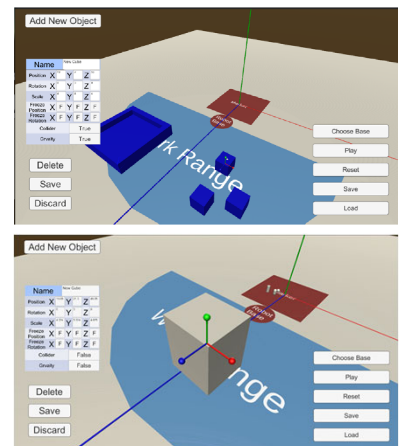
### AR Player

View the augmented reality scene.



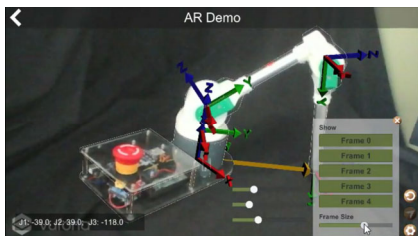
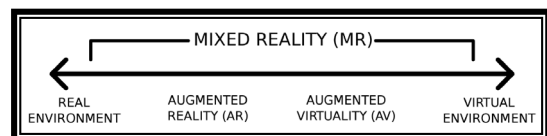
### Scene Builder

Build the augmented reality scene.

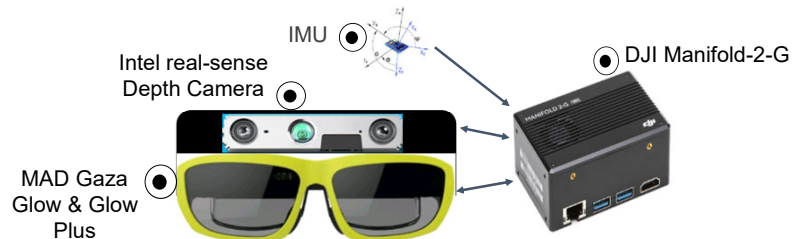


## Mixed-Reality AR+VR H/W

Our latest mixed-reality H/W setup for several on going projects such as robot-human interaction, teleoperated visits, advance and interactive mixed reality robotics labs.



AR Utilization for robotic poses demonstration



Mixed-Reality H/W Setup