

Smart Room as a CityOS node





Jorge Ortiz



Oscar Wu



Taqiya Eshan



Shuren Xia



Qiwei Li

Team Members

Person A

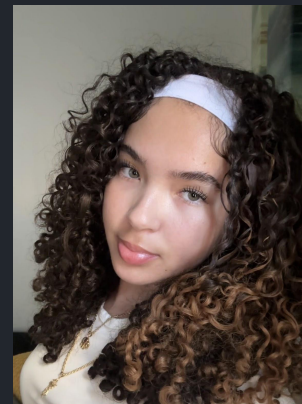


Crystal Burbano O.

Person B

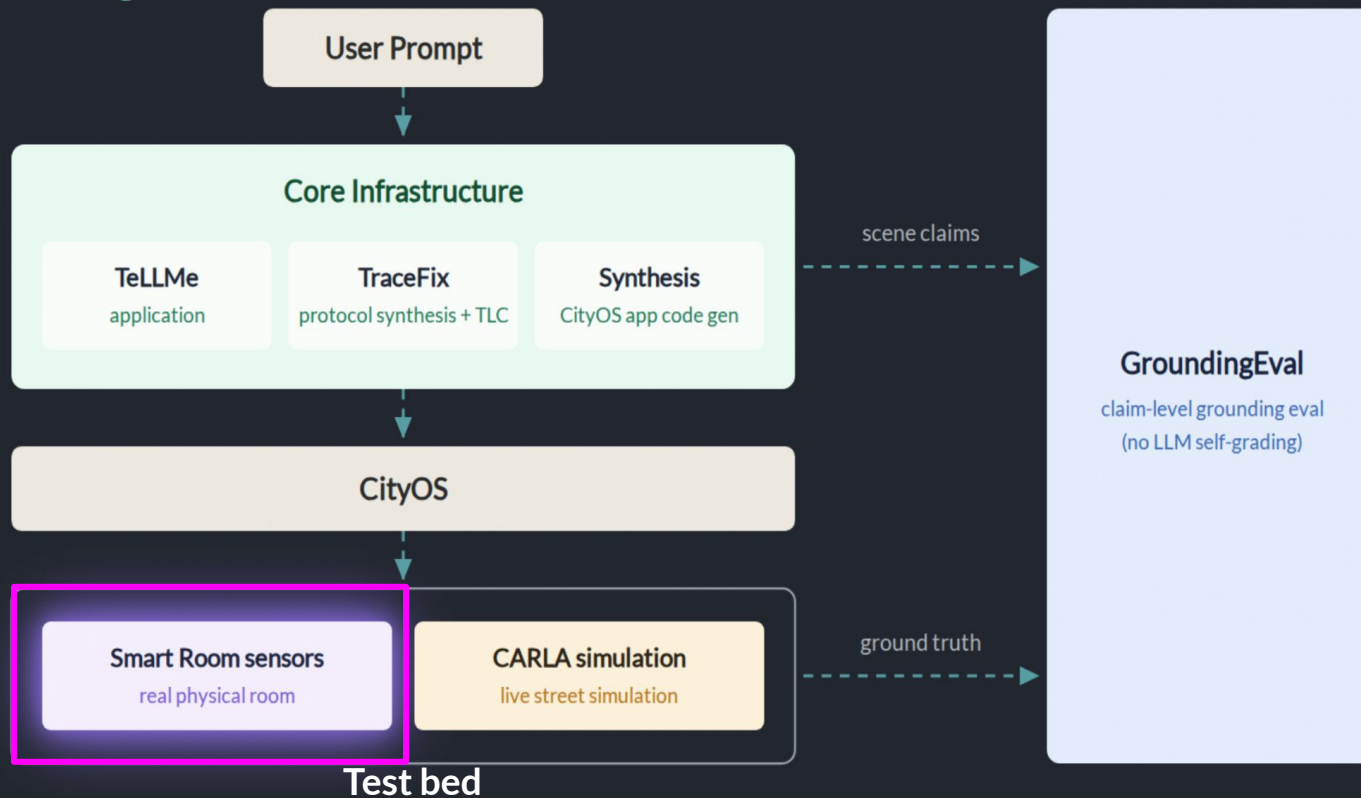


Alan Jiang



Eliana Nuñez

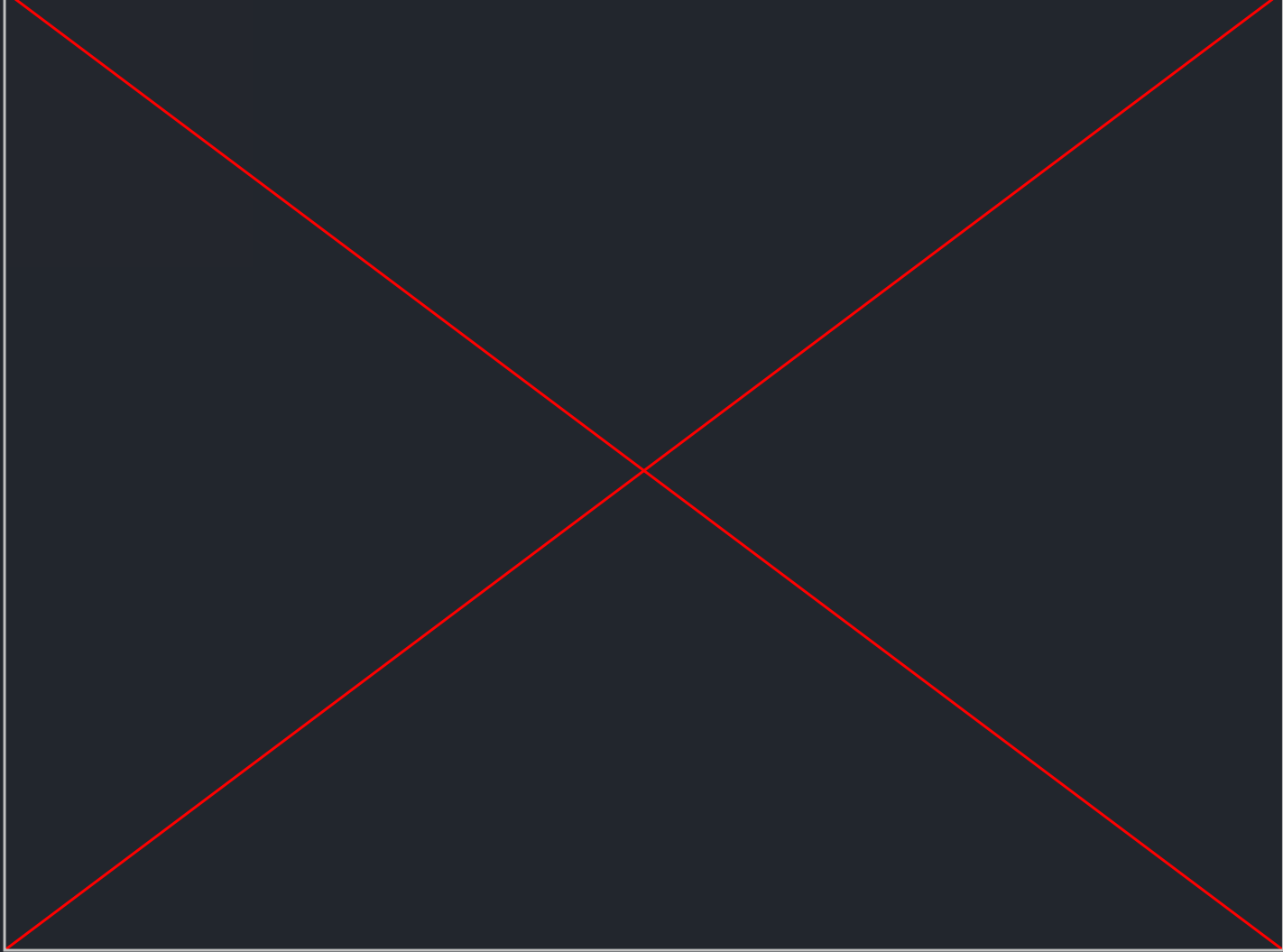
Pipeline Overview



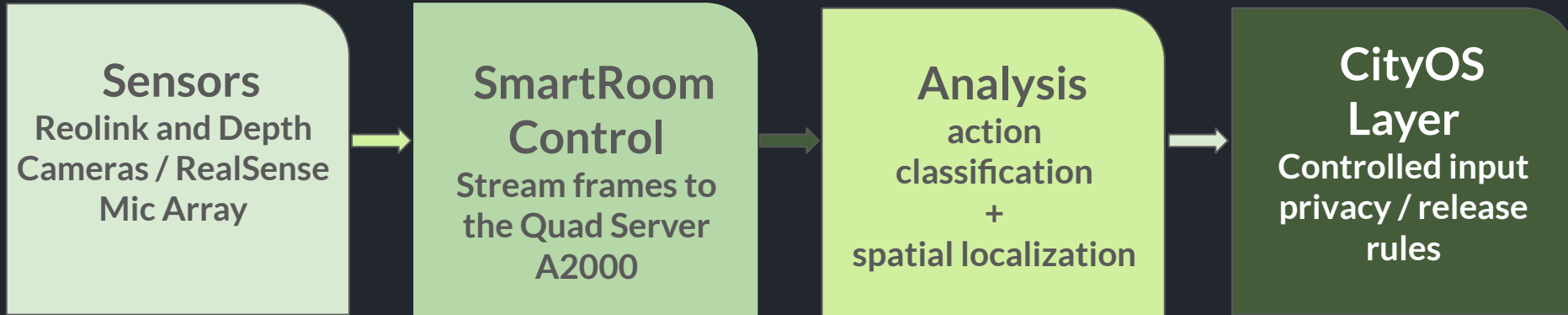
Overall Goal

What is going on inside of a room?

How to ensure data is accurate?



System Architecture



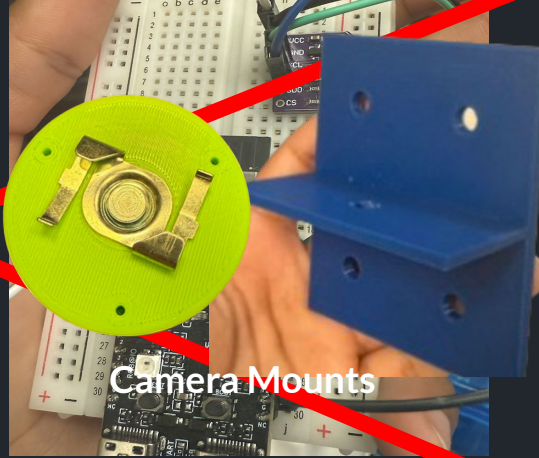
Finalized Hardware EQUIPMENT



Intel Realsense Depth Camera

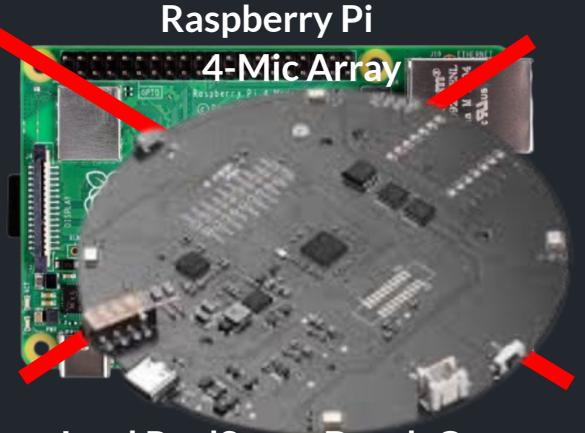


ReoLink 4- Security Camera



Camera Mounts

Microcontroller + Temp Sensor



Raspberry Pi
4-Mic Array

Intel RealSense Depth Camera



data looked like a more practical path for final deployment & scaling

- Custom mounting/sync work supported more stable spatial/action data

Cross camera fusion

what is in the room



Time Synchronization

- Use location + Personal Attribute
- Reasonable to find the right principal point, lens distortion
- Recognition to verify between cameras
- Run a pipeline for playback & world frame to timestamp

Action Classification

labels body movements, behaviors, or activities shown in videos

Video Frames



Real Time Multi-Person
pose estimation



Sliding Window



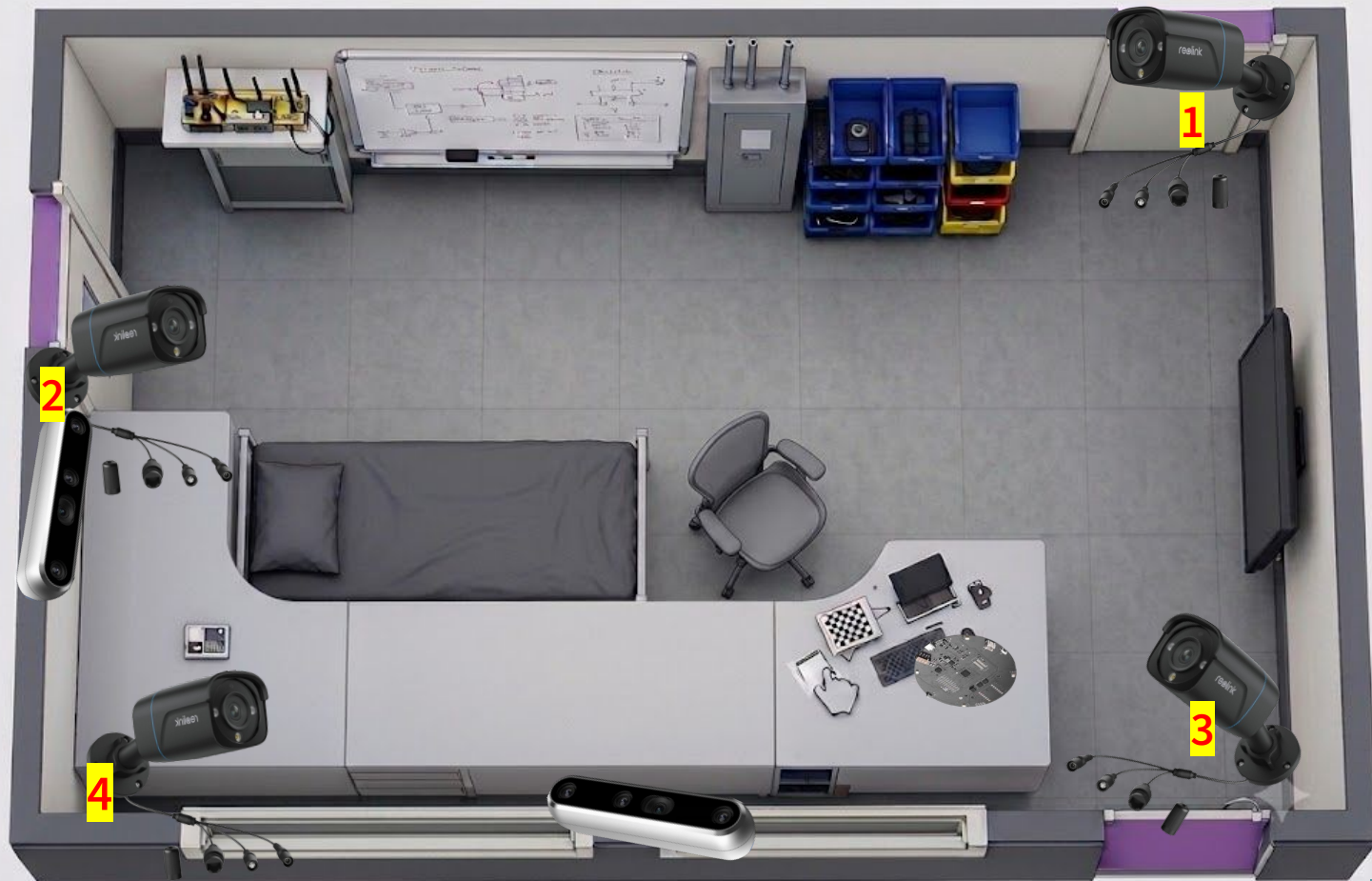
Temporal Classifier (time)



Action Label



Room Layout



RECORDING

1:42 PM 2026-

07-23

2 CAMS - LOCATED

CAMERA

Both

D435

D455

3D OVERLAY

Pose

Objects

Actions

VIDEO OVERLAY

None

Pose

Objects

Actions

II

00:17.9 / 02:59.9



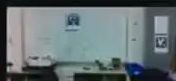
7-28 - 3:42 PM



07-28 - 3:39 PM



07-23 - 2:48 PM



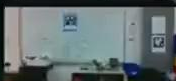
07-23 - 2:45 PM



07-23 - 1:45 PM



07-23 - 1:42 PM



07-23 - 1:39 PM



07-23 - 1:27 PM



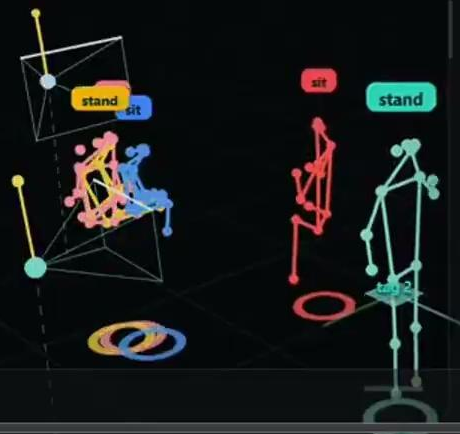
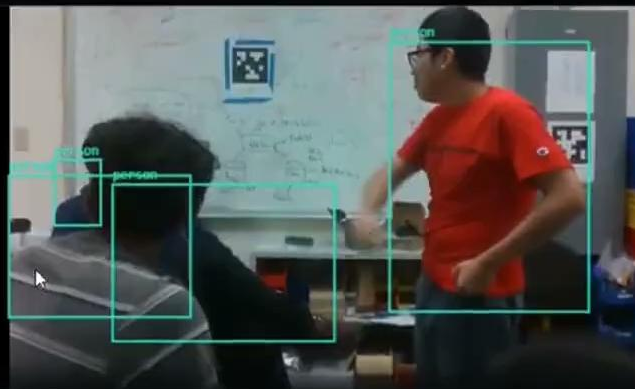
07-23 - 1:15 PM



07-23 - 12:57 PM

D435

raw



speed 1.00x 405 fps

Metrics



Future Improvements

More testing event ingestion

Deploy CityOS

Improve Spatial Localization

Migrate to new PC

Sound classification

Click on QR Code
to visit our Wiki!

