



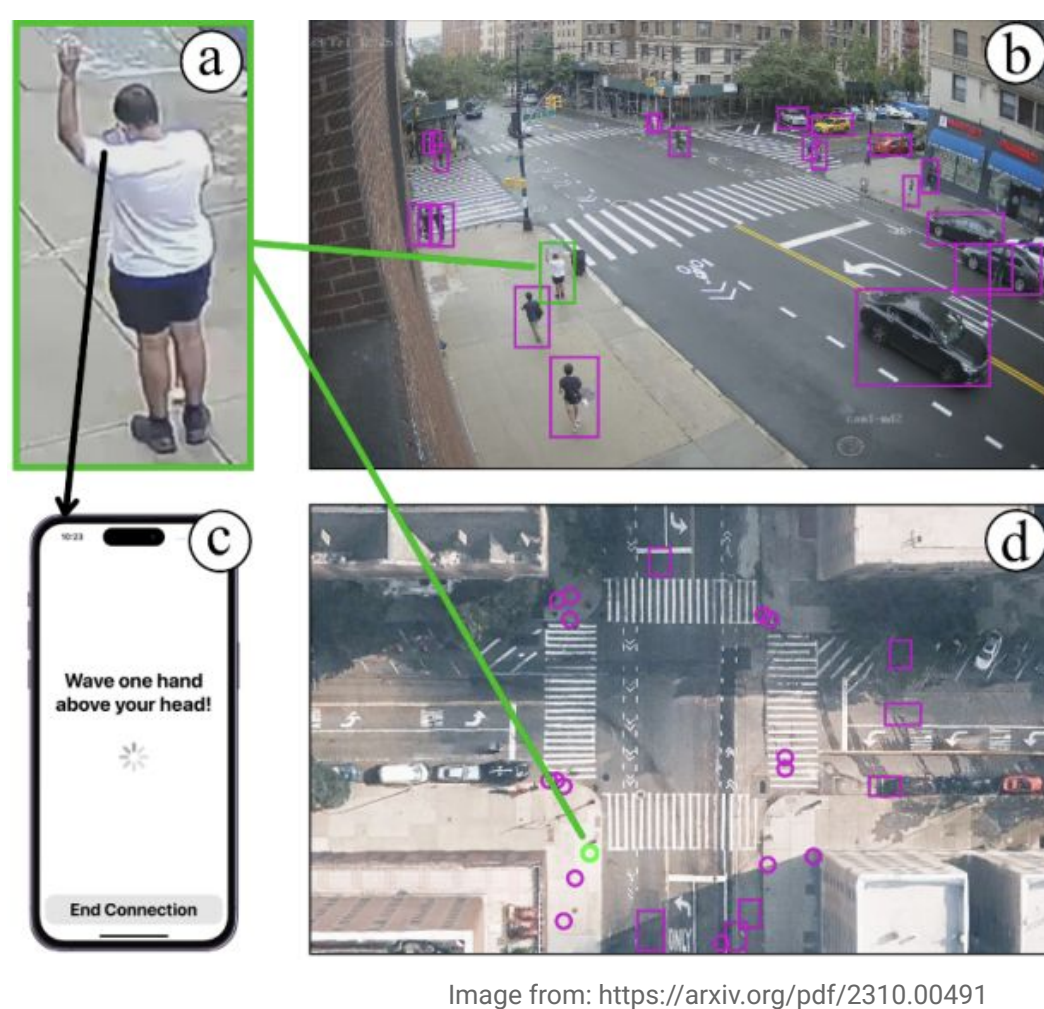
Introduction

SASS(Streetscape Application Service Stack) is a software framework that processes data collected from sensors all around in cities. Its main goal is to support development of highly responsive and efficient urban applications.

The urban applications are aimed to improve:

- Safety
- Mobility
- Quality of Life

Existing projects required subjects to raise their hand in the middle of the city, causing communities to voice their concerns. We want a feature that identifies individuals based on their gait.



Data Collection Setup

Three participants, each equipped with IMU sensors, walk within a white-lined triangular area.

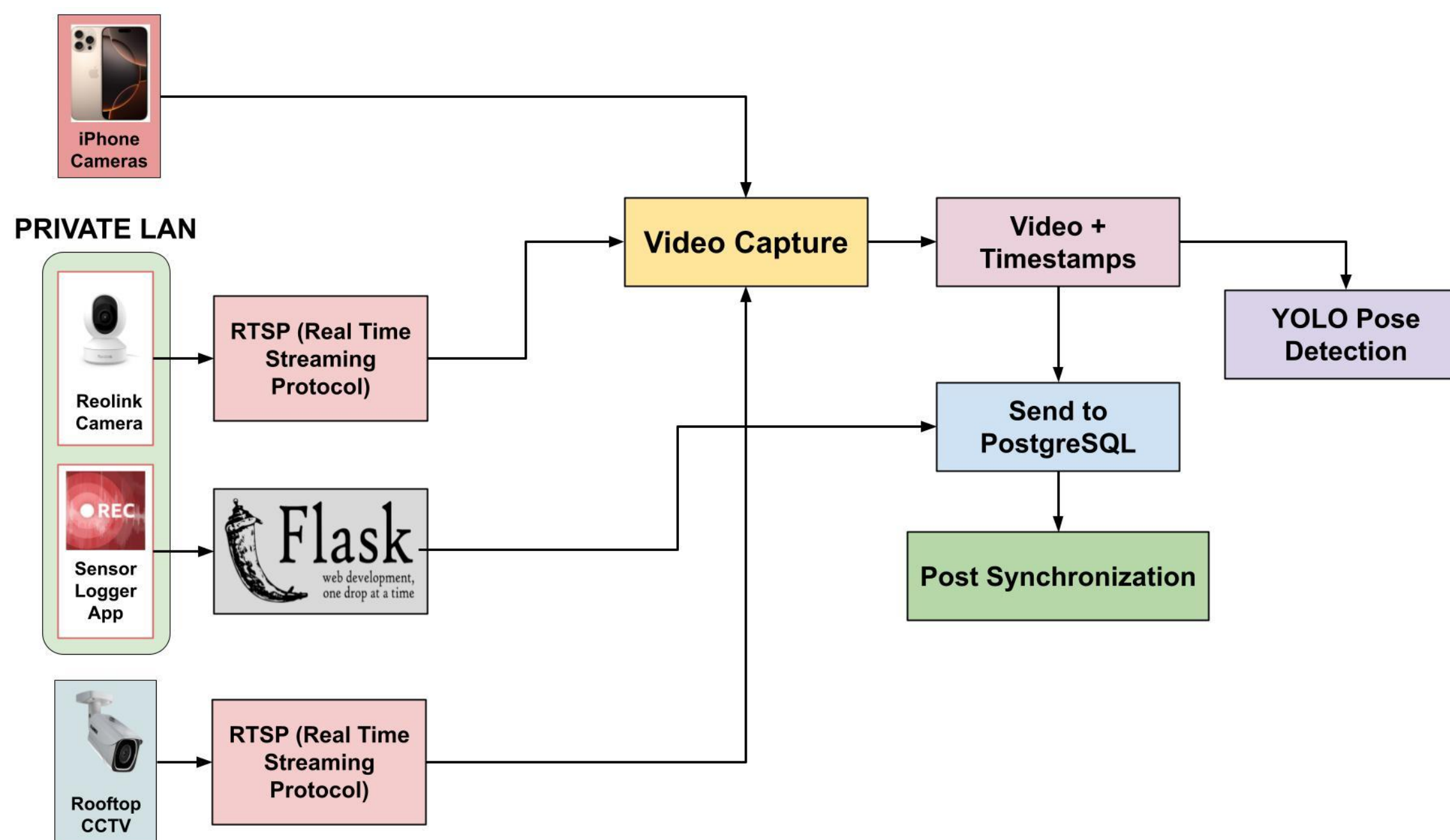
Five synchronized cameras record the sessions:

- Rooftop CCTV
- Reolink surveillance camera
- Two iPhone cameras
- XBotGo auto-tracking Camera



System Design

- Different modalities included:
 - Vision (iPhone cameras, Rooftop CCTV camera, Reolink surveillance camera)
 - Inertial (IMU sensors from SensorLogger App)
 - Accelerometer, gravity, gyroscope, and orientation
- We simultaneously ingest RTSP video streams from Reolink, and rooftop CCTV alongside IMU data via a Flask-powered SensorLogger on a dedicated private network.
- Videos are then fed into a YOLO Pose detection module, which stores results in a unified database.
- The IMU values are stored in a PostgreSQL database with a separate table for each subject.



Dataset Statistics

- Subjects: 3
- Total sessions: 10
- Session Durations: 3 min 30 secs
- Total body parts covered: 11
- Total videos so far: 50
- Number of tables: 4
- Video resolutions:
 - 2 iPhone cameras: 1280 x 720
 - Reolink camera: 1280 x 720
 - Rooftop camera: 1920 x 1080
- IMU sensor frequency: 10 Hz

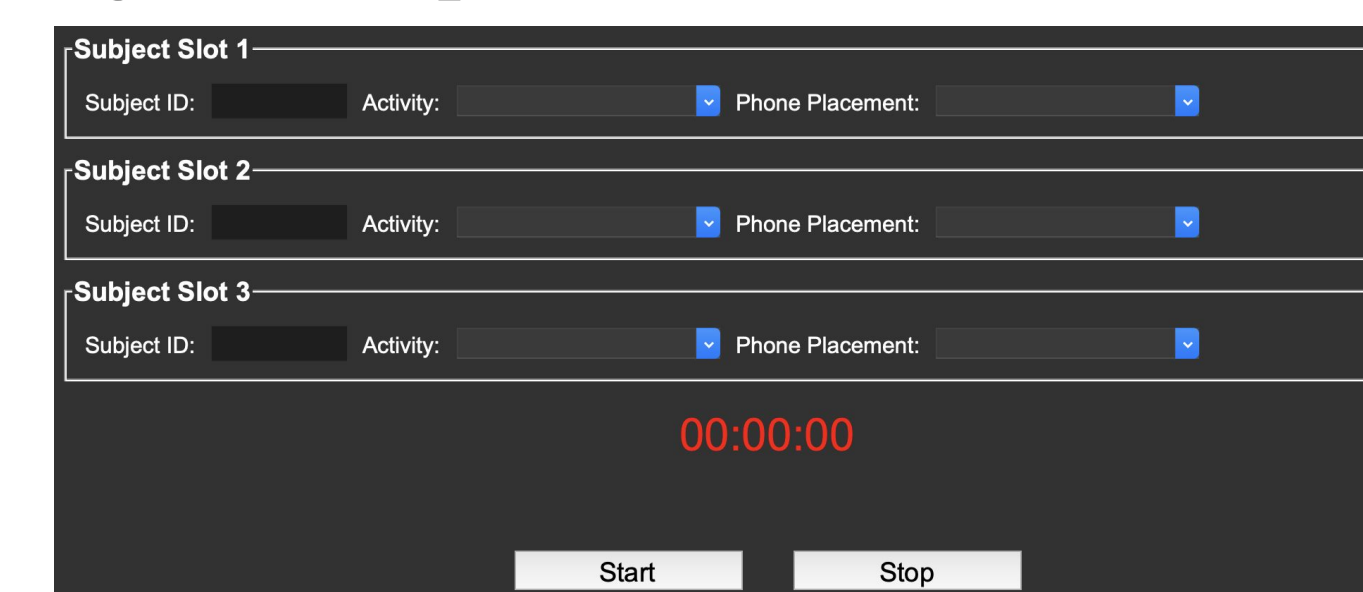
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text	integer	timestamp with time zone
1 reolink_capture_new.avi	1	2025-07-29 11:14:04.910368-04
2 reolink_capture_new.avi	2	2025-07-29 11:14:04.935711-04
3 reolink_capture_new.avi	3	2025-07-29 11:14:04.957331-04
4 reolink_capture_new.avi	4	2025-07-29 11:14:04.974791-04
5 reolink_capture_new.avi	5	2025-07-29 11:14:04.990398-04
6 reolink_capture_new.avi	6	2025-07-29 11:14:05.006474-04
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9 reolink_capture_new.avi	9	2025-07-29 11:14:05.053901-04
10 reolink_capture_new.avi	10	2025-07-29 11:14:05.075526-04
11 reolink_capture_new.avi	11	2025-07-29 11:14:05.091054-04
12 reolink_capture_new.avi	12	2025-07-29 11:14:05.107076-04
13 reolink_capture_new.avi	13	2025-07-29 11:14:05.123159-04
14 reolink_capture_new.avi	14	2025-07-29 11:14:05.14248-04
15 reolink_capture_new.avi	15	2025-07-29 11:14:05.158188-04

GUI Interface

Our workflow:

- Input Subject ID, Activity, and Phone Placement
- Press Start, which automatically:
 - Connects to the PostgreSQL database
 - Listens for IMU sensor readings
 - Initiates video recording

Supported Sensor Placements(11 total):
left and right wrists, left and right arms,
left and right hands, left and right front pockets,
left and right back pockets, middle back



Dataset Samples



Future Plans

- Continue collection of data.
- Post data collection synchronization.
- Build baseline models like 3D CNN + LSTM trained jointly with contrastive loss.
- Test the baseline models with other publicly available datasets like VIDIMU.