



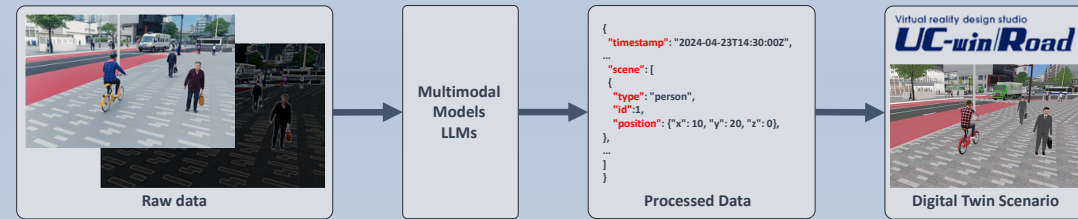
PRIVACY-PRESERVING **DIGITAL TWIN** SURVEILLANCE SYSTEM

CONCEPT

Our ASASOBI privacy-preserving surveillance system utilizes multimodal LLMs, to observe a scene by digital twin. Data captured from sensors and camera is processed locally, anonymized by multimodal models to extract notable features to display in a real-time digital twin in UC-win/Road.



SOLUTION



ASASOBI creates a digital twin from IoT sensors or cameras' data to monitor any scene in real time

ADVANTAGES

- Privacy-Preserving:** Only processed data is sent (e.g., movement, direction).
- Cost-Effective:** Reduces deployment and operational costs by processing data with AI and sending lightweight JSON instead of video.
- Real-Time Insights:** Offers real-time monitoring without compromising privacy.
- Scalable:** Can be deployed in different environments like smart cities and public safety systems with the current infrastructure.

IMPLEMENTATION

ASASOBI system has been tested with use cases in Public Safety and Smart City Applications



Actual scene



Digital twin

BACKGROUND

In today's world, appearances becomes vulnerable because cameras are ubiquitous, capturing sensitive information that can be faked or misused, leading to identity theft and other forms of fraud.



PROBLEM

- Traditional monitoring systems rely on direct streaming of raw video and audio.
- These systems expose identifiable features like faces, voices, and demographics, increasing the risk of privacy breaches.
- Streaming video directly to servers can result in data leaks or unauthorized use of personal information.

We need an innovative solution to monitor while protecting others' identity!

Manual

System Requirements

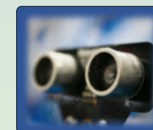
- Python3.8 or later
- OpenAI APIKey (for GPT-4-o-mini vision processing)
- Supported sensors:
 - Ultrasonic HC-SR04 radar sensor
 - USB-connected LiDAR sensors
 - Conventional cameras

Step

- Setting up the Observer
- Connecting Sensors
- Running the Observer
- Running the Monitor

In our case, we use standard camera and sensors module on Raspberry Pi platform IoT server

FUTURE TASKS & IDEAS



Integrate additional IoT sensor types, aim to truly digital twin



Optimize the AI models for faster processing and more accurate anonymization, reduce the delay