Real Time Department Occupation Tracker

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Abstract

The goal of this project is to create a network that delivers real-time information on the occupancy of university departments and buildings for students and for statistical purposes. This enables students to swiftly find suitable study spaces, circumventing manual searching and conserving valuable time.

ARQUITECTURE

The department is configured with a setup where each entrance/exit of the building is equipped with a camera linked to a Jetson Nano. This is to ensure no individuals are missed while entering or exiting, thereby maintaining a reliable count.
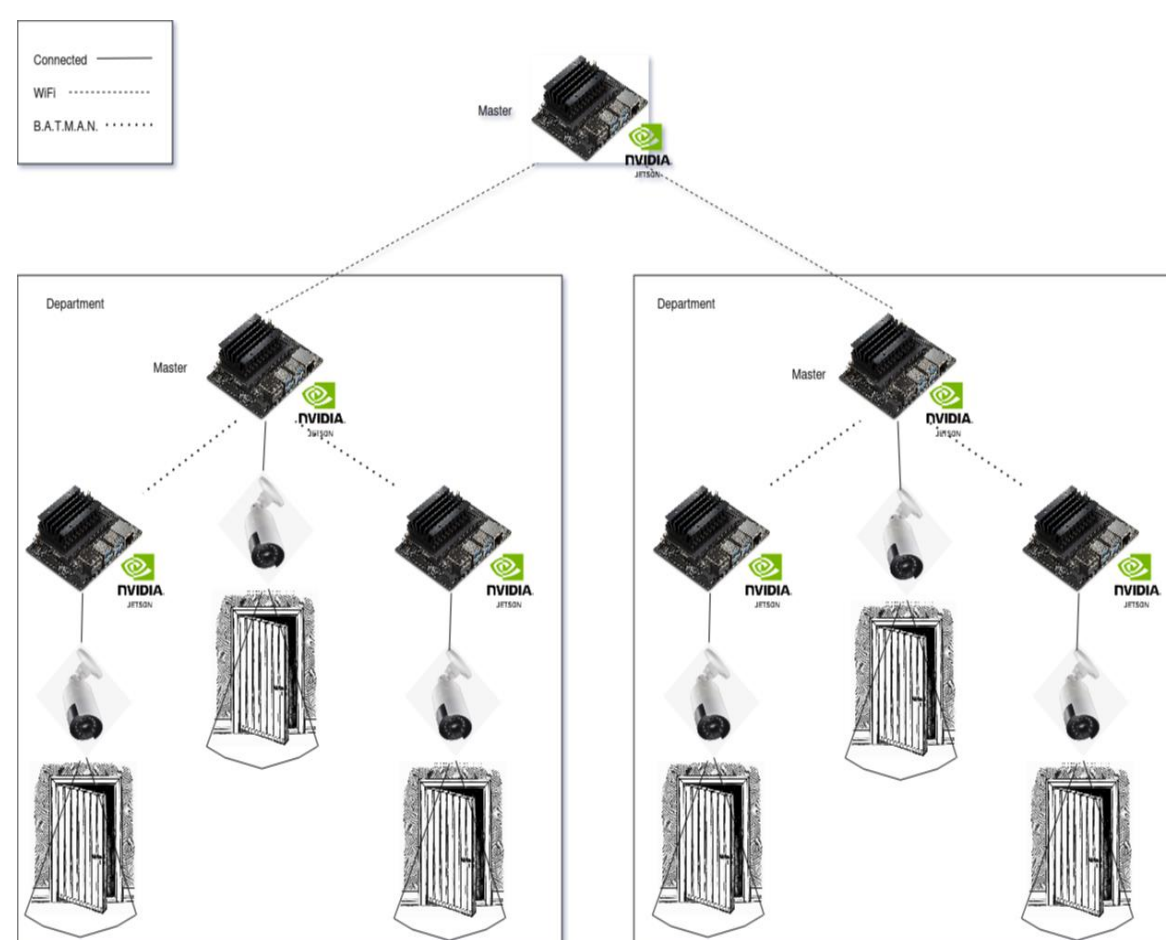

Fig 1 - System Architecture

Fig 2 - Packet Timeline

PACKET TIMELINE

When a person is detected by the camera, the data is encoded and routed optimally by B.A.T.M.A.N. The master Jetson, an MQTT topic subscriber, receives the packet published by the camera Jetson via an MQTT broker. After processing the data, the master Jetson sends it to the dashboard Jetson over Wi-Fi, which then displays the information.
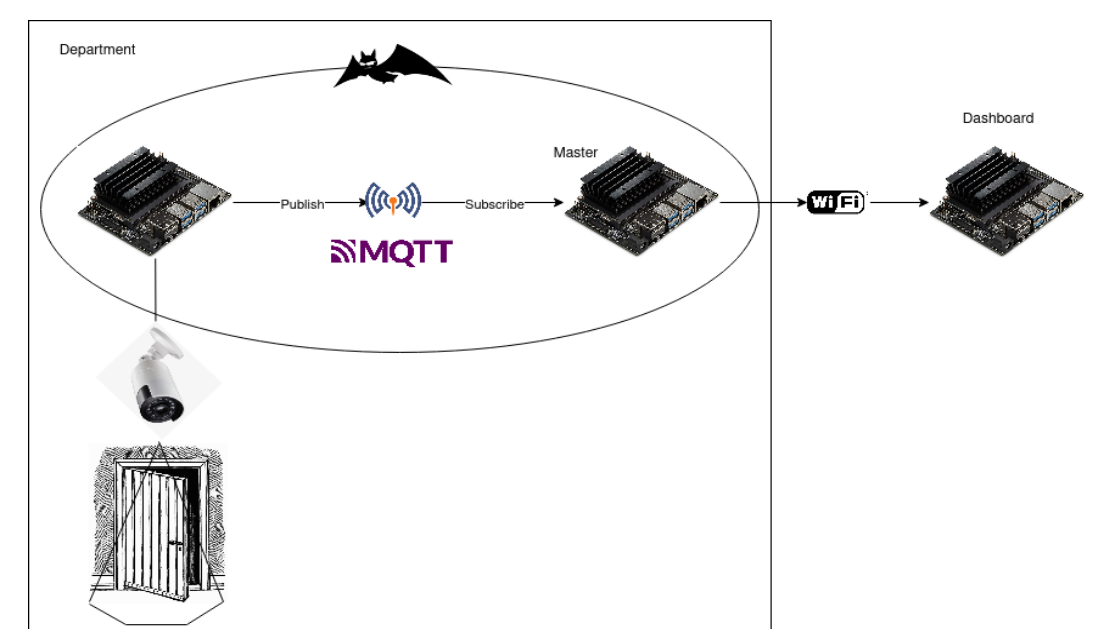
DETECTION

We utilized a combination of Yolo for person detection in an environment and OpenCV to ascertain the direction of movement and determine whether individuals have crossed the threshold of a door to monitor the flow of people entering and exiting a building.
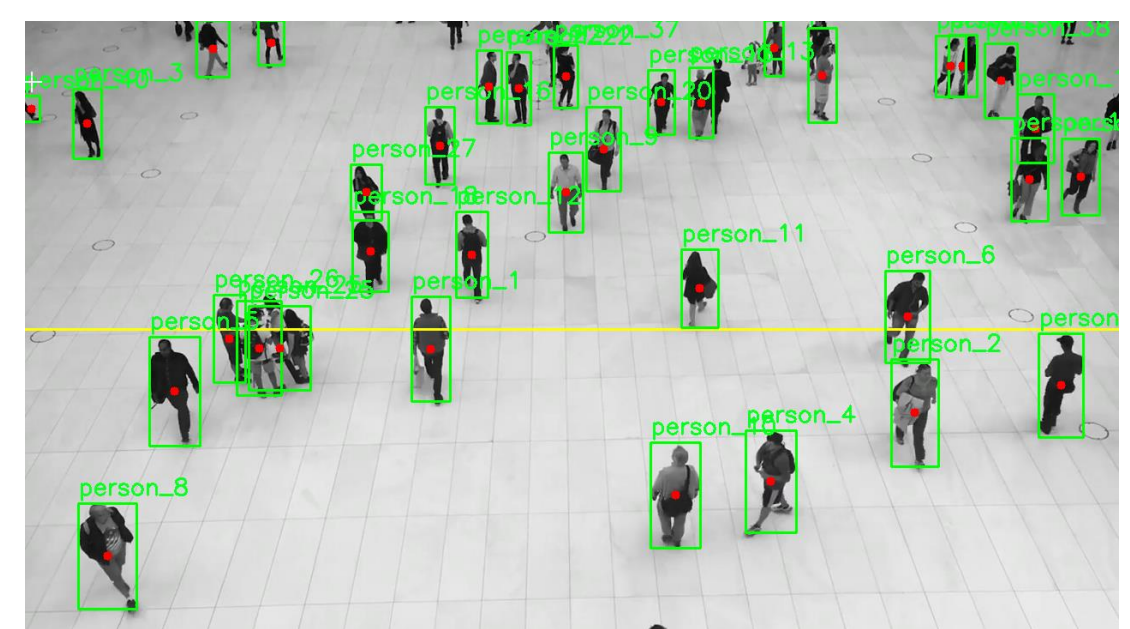

Fig 3 – Detection Stream

Fig 4 – Detection Log

Conclusion

This project aimed to provide extensive support to students in all university departments by ensuring ample device availability, potentially benefiting the entire university community on a broad scale.

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