

Pedestrian detection

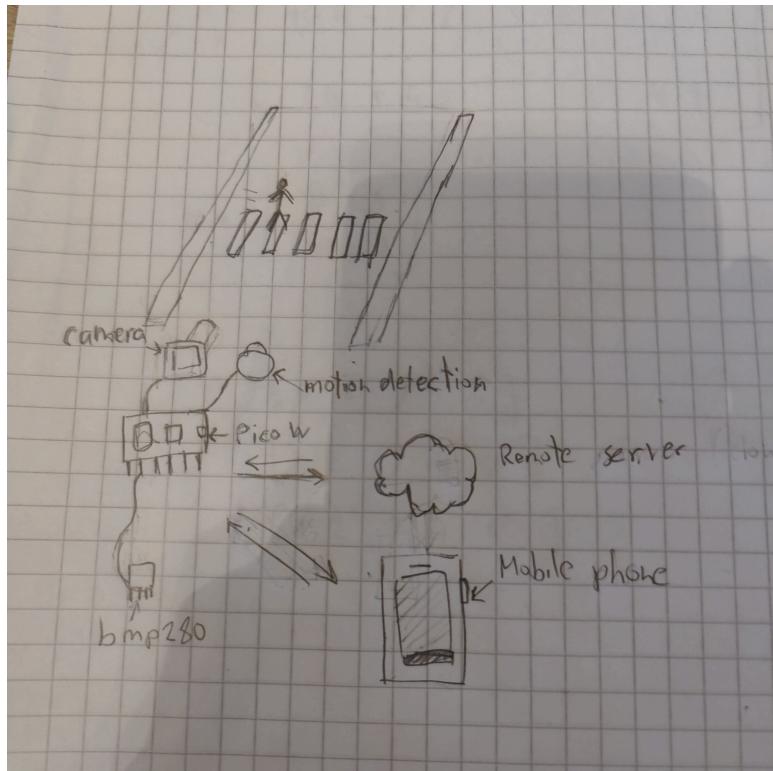
Group members

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Functionalities

- Detects movement
- Measures weather conditions
- Counts number of pedestrians
- Takes image
- Image, weather data and pedestrian count gets sent to remote server
- Android app to configure settings on microcontroller (e.g when to take pictures, turn on/off etc.), and for visualizing statistics of data processed by Pico W

Architecture



Required components:

- Pico w
- Camera OV7670
- Motion sensor HC-SR501

- Temp/pressure sensor bmp280

Additional requirements: Remote server host (someone's PC), mobile phone for running application.

Evaluation (testing)

Accuracy: $|\text{true pedestrian count} - \text{detected pedestrian count}| / \text{true pedestrian count}$ (Manually / with own eyes test with small set size to get true total pedestrian count)

Throughput: Frames per second

Latency: Latency between app and Pico

Design Choices

- Object detection server: Python + Ultralytics YOLO, TCP or TLS connection
- Raspberry Pi Pico with micropython
 - Pico W webserver for Android communication
- Android app with API level 33