Gait Smart Lock

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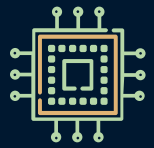


Design & Motivation Recap

Motivation: Contactless Door Unlocking. When a user is authenticated by their unique gait, a smart lock will unlock when the user approaches a door.

Process

Sampling

Sample user's walking data with the Arduino clipped to their belt

Authentication

Matching users with unique gait, and authenticating it to unlock/open door.

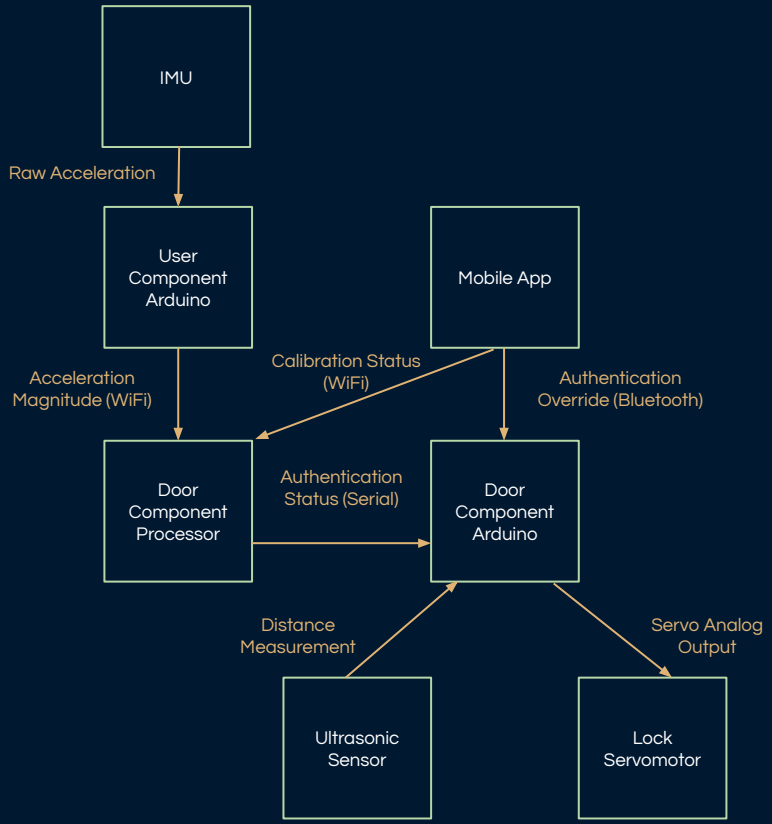
System Network

Calibrate IMU data for authentication and distance measurement from door component

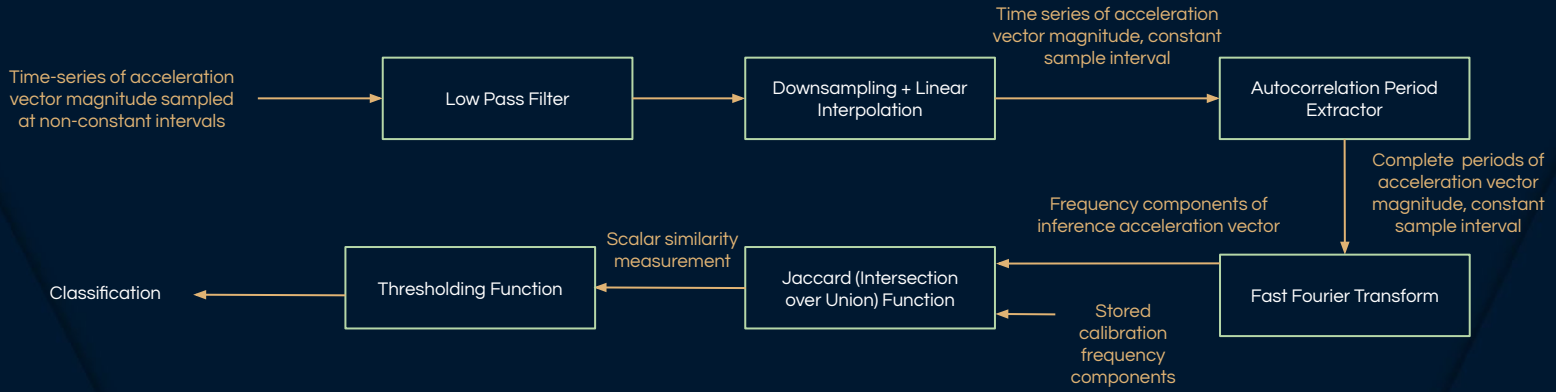
Processing Data

Running an inference process with data to create a decision tree & find classification

System Network Diagram



Inference Process Diagram



Final Results

Automatic Lock/Unlocking

The door's locking/unlocking mechanisms are highly reliable

Bluetooth Override

We are able to override door lock manually

Gait Detection

Accuracy: ~80%
F1 Score: ~60%

Individual Gait Calibration

Auto-Thresholding: Identify similarity value to generate high precision

DEMO!