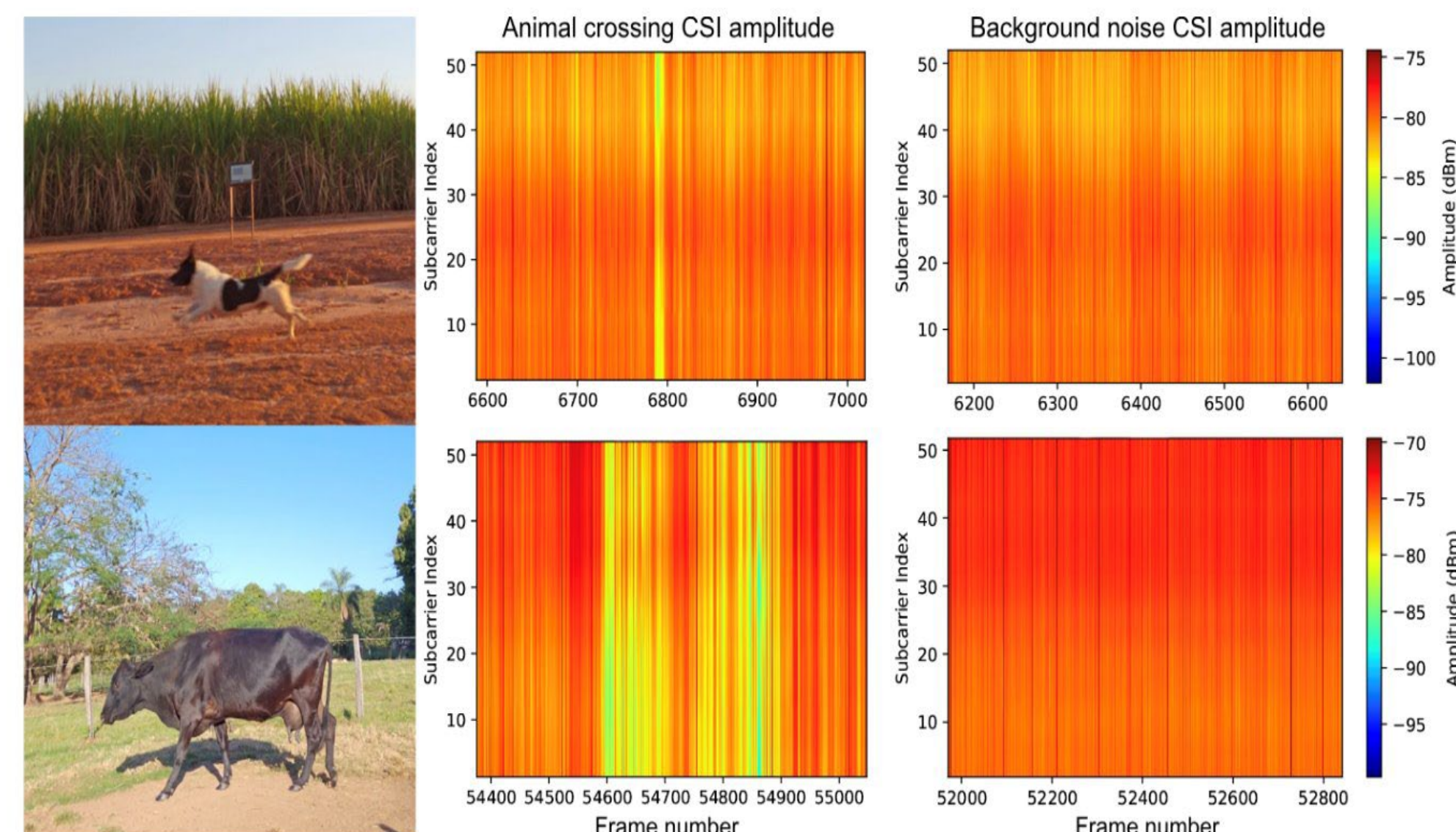


# E1.14 – Wi-Fi Sensing

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Dr. Carvalho



## Overview



Wi-Fi is already widely deployed, and the new IEEE 802.11bf standard enables it to support sensing as well as communication. Our project investigates how existing Wi-Fi infrastructure can detect human motion, falls, respiration, and other subtle activities. We plan to develop and publish a research paper on our findings next year.

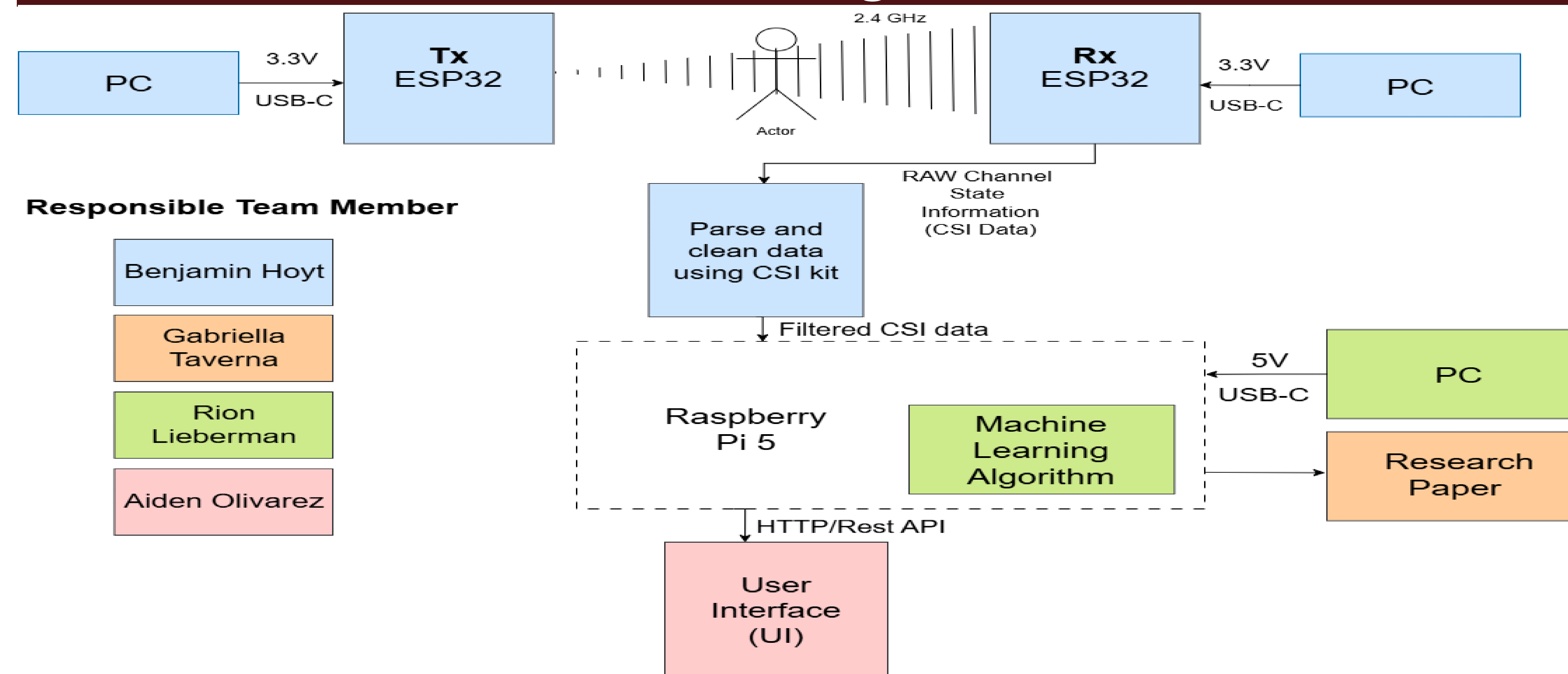
## D1 Accomplishments

- Started our research on Wi-Fi sensing and CSI data.
- Sent and received CSI using ESP32-C6
- Started Research paper.

## D2 Plan

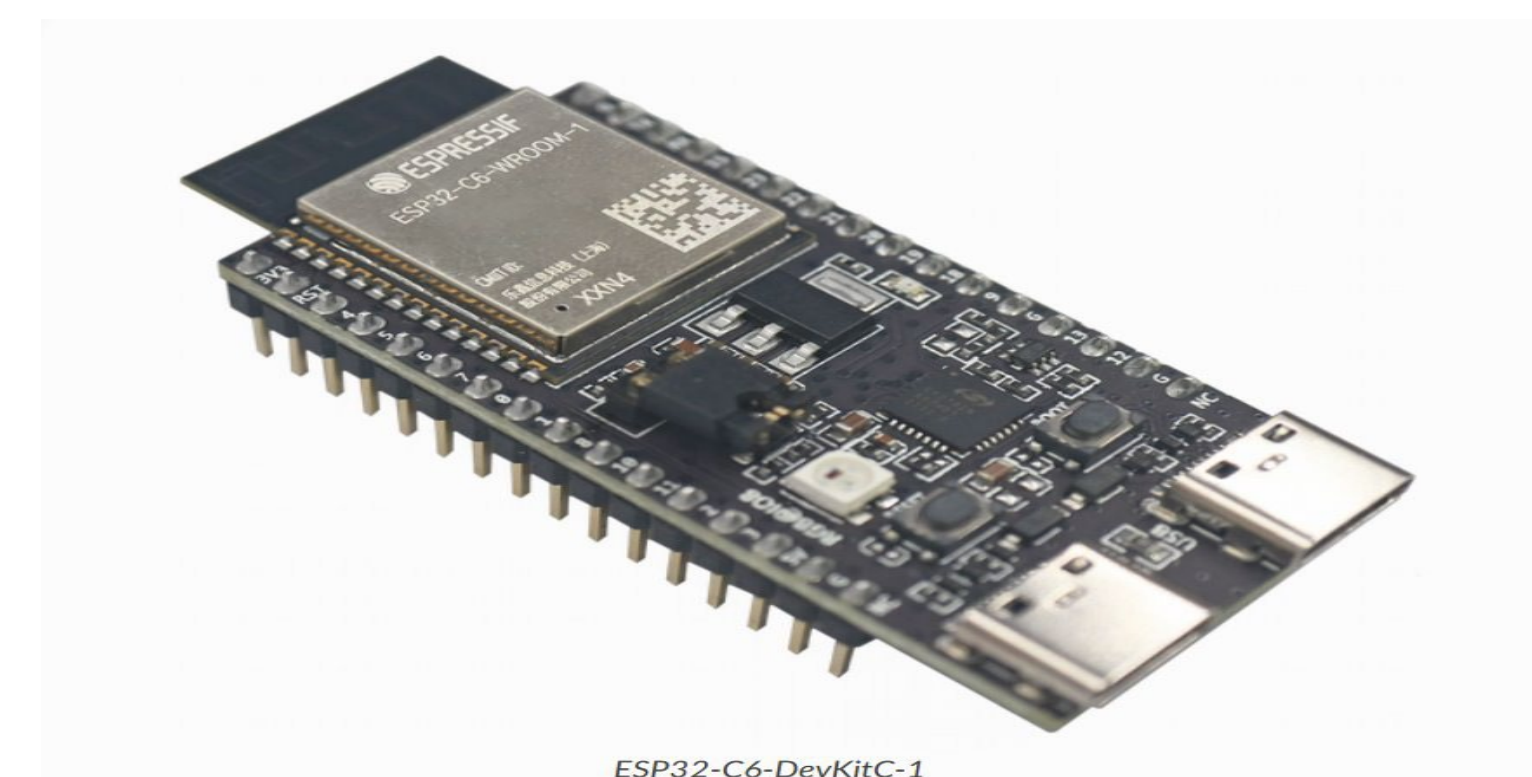
- Test multiple environments
- Decide upon a ML model

## Block Diagram



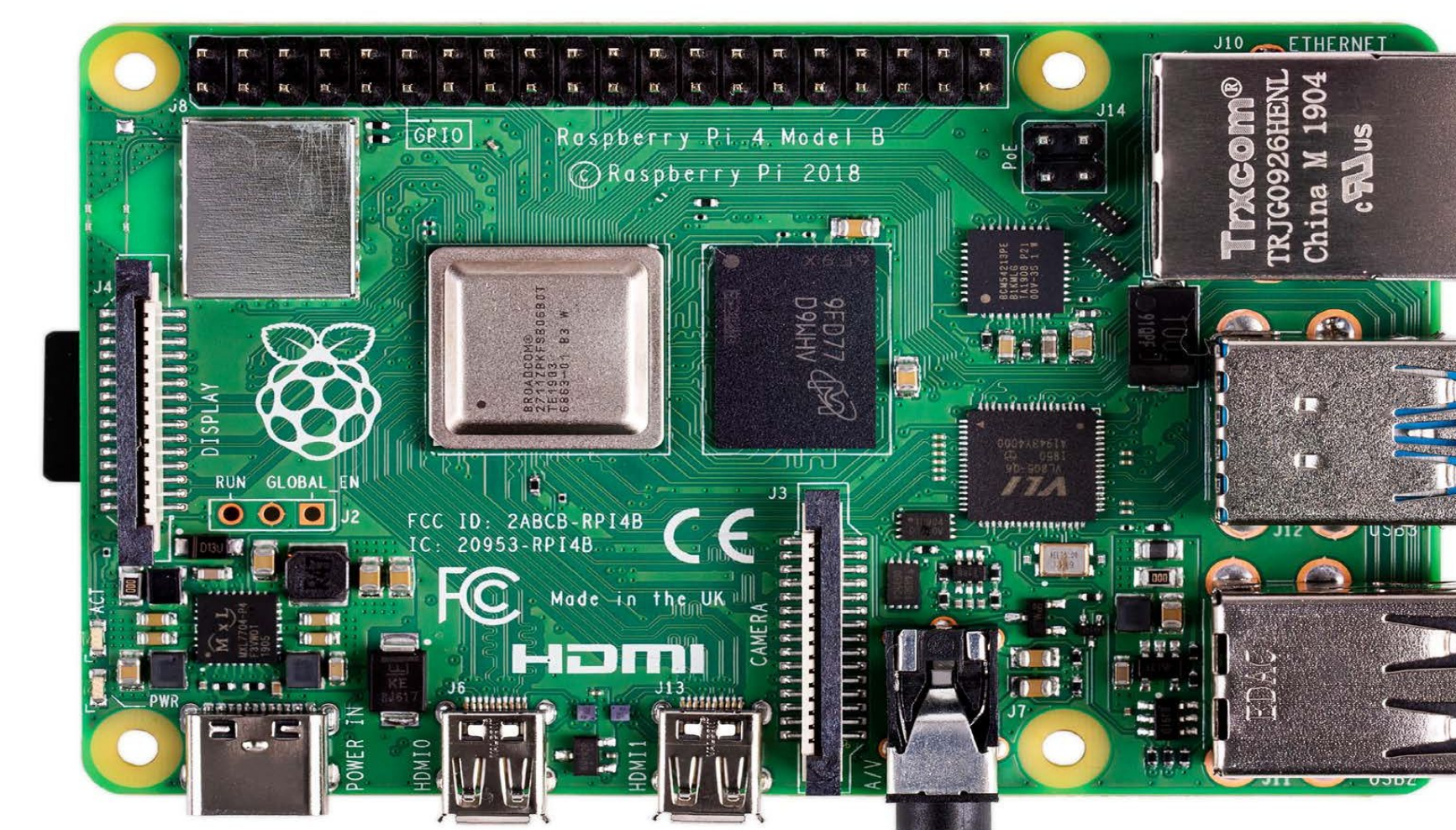
## ESP32-C6

- Built-in CSI support
- Wi-Fi 6 / 2.4 GHz capability, giving more stable and frequent CSI frames



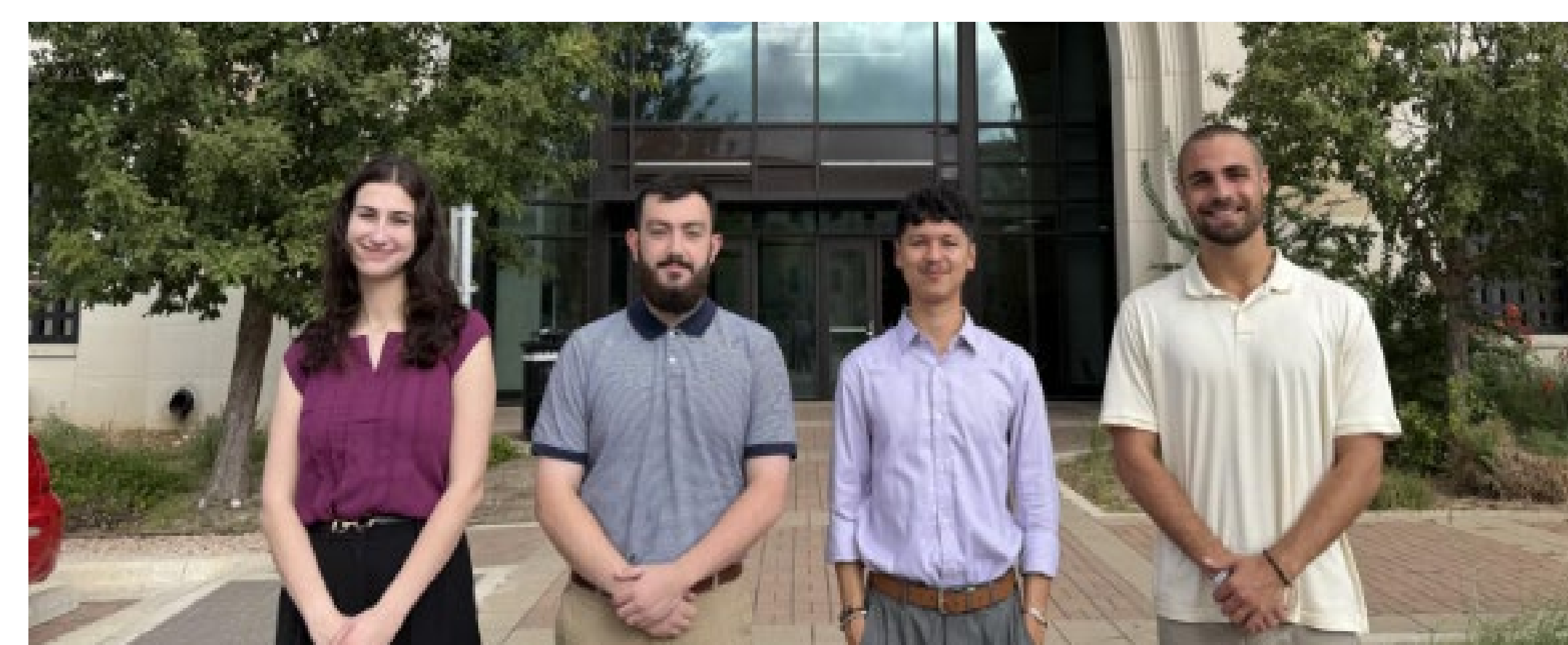
## Raspberry Pi

- Processing Node (8GB RAM)
- Host web-based



## Channel State Information

- CSI measures changes in Wi-Fi signals as they move through environments
- Key data source enabling Wi-Fi sensing
- Per-subcarrier amplitude and phase information



Gabriella



Rion



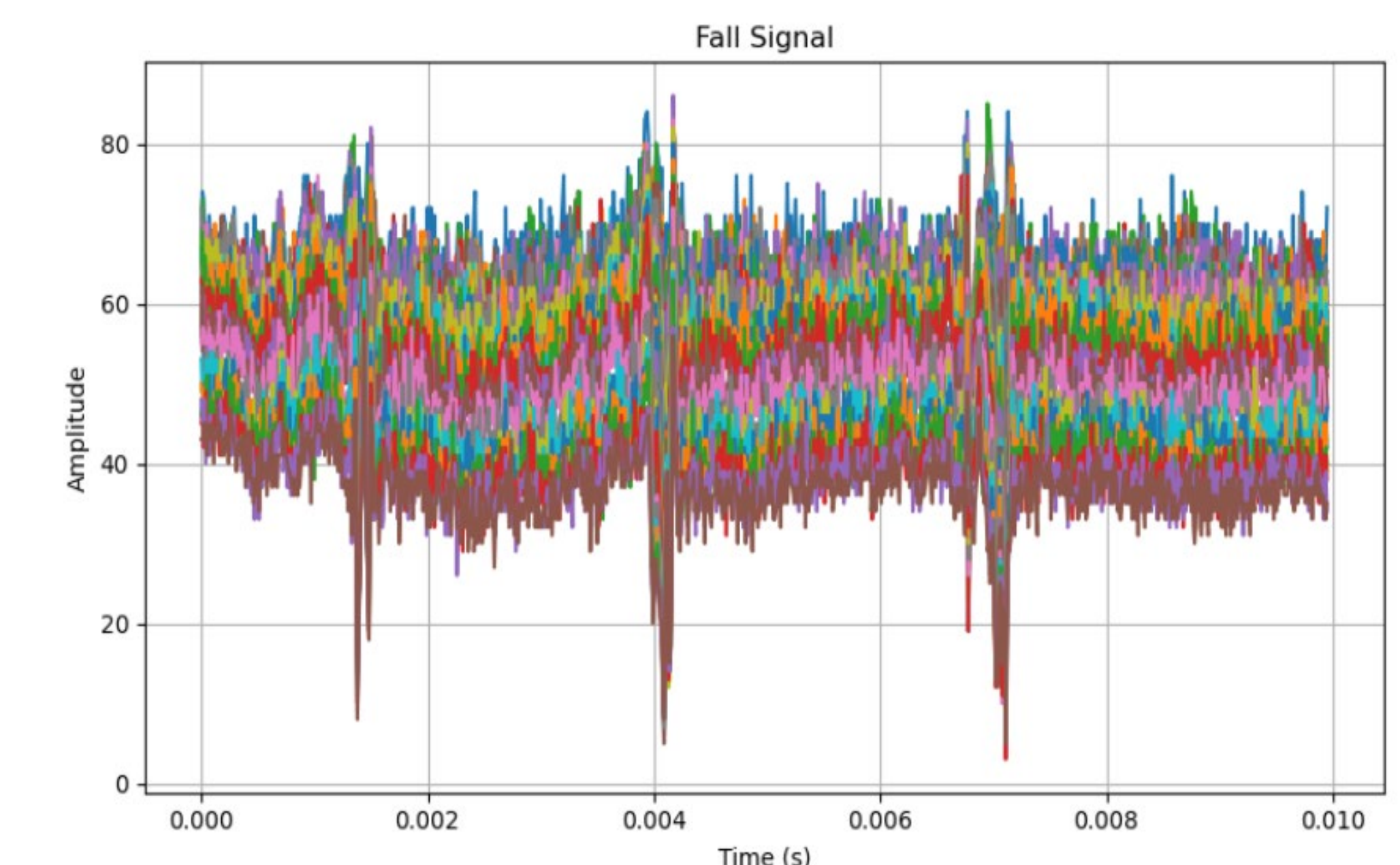
Aiden



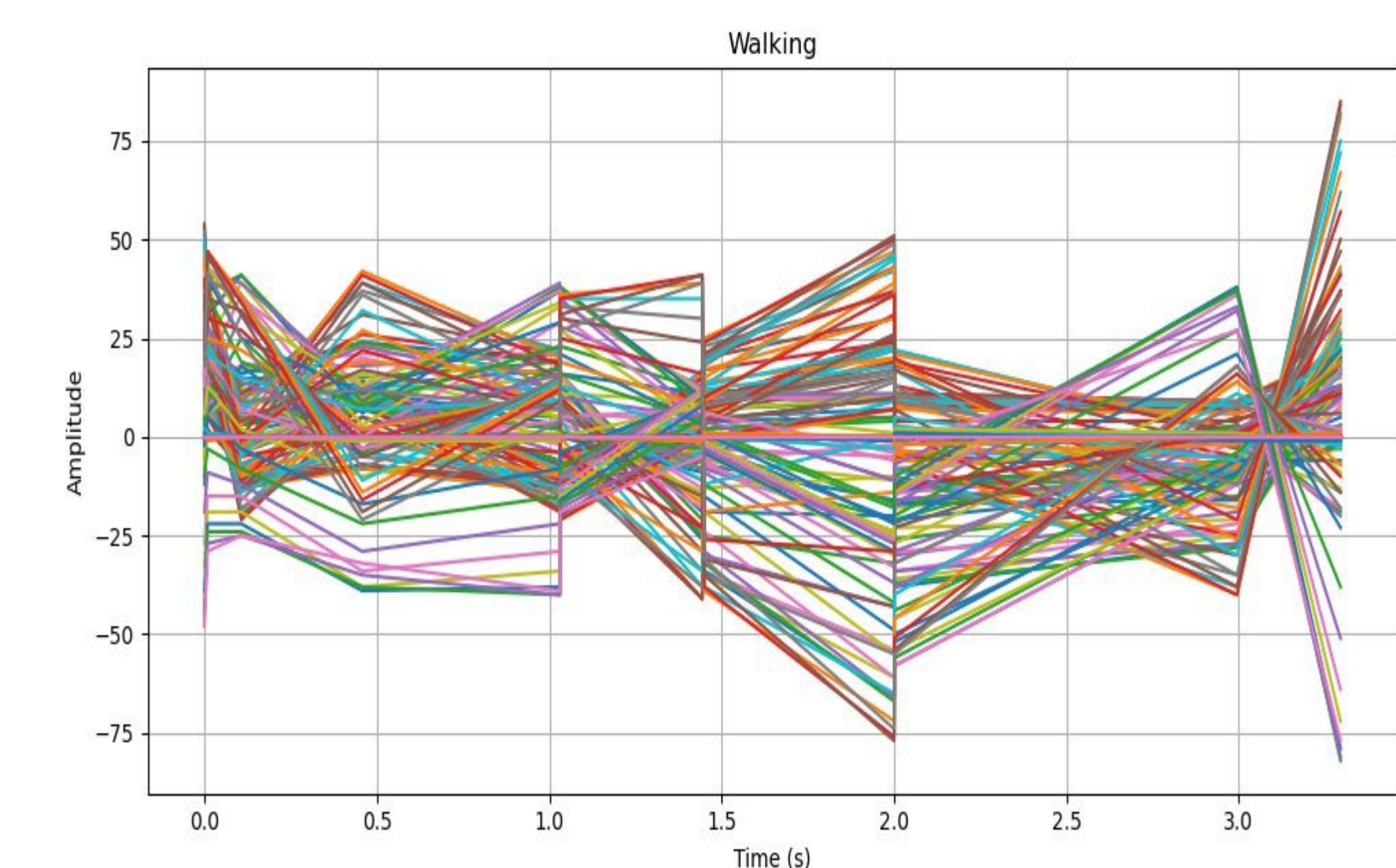
Benjamin



## Data Comparison



- Sample data of person falling



- Collected data of a person walking

## Potential Roadblocks

- Currently pending ITAC approval for testing
- Excess noise in the room may interfere with the sensing.

## Acknowledgments

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