



# TipsyCap

A wearable device for detecting alcohol intoxication

[illegible]



**Sure there's breathalyzers,  
but can you wear them?**

A person is shown from behind, crouched low to the ground at what appears to be a bar or outdoor seating area. Two beer bottles are on the ground in the foreground. The background is blurred, showing other people and lights. A semi-transparent dark blue horizontal band across the middle of the image contains white text.

Using commodity hardware/sensors can we fabricate a comfortable wearable device that can predict alcohol intoxication?

# Device and Overview

## Hardware

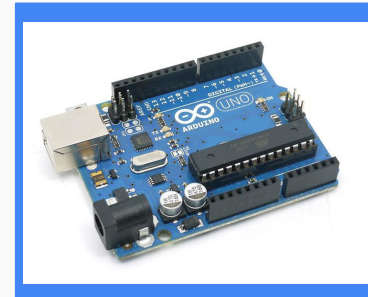
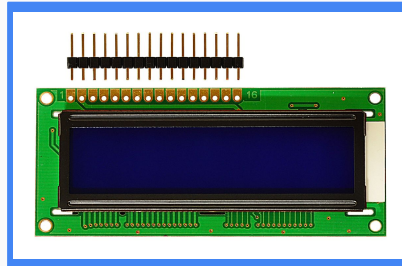
- Arduino Uno
- OpenLog
- LCD Screen
- Real-time clock

## Sensors

- Accelerometer and gyro
- Alcohol sensor

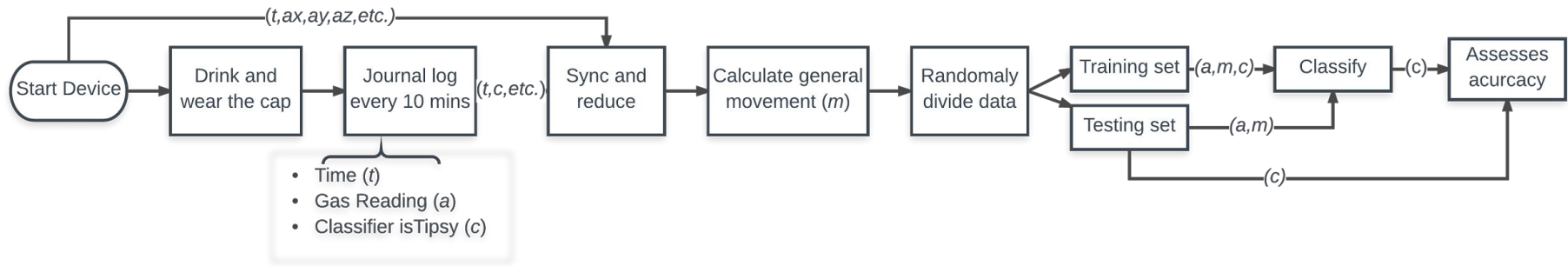
## Software

- Occurs sensor/time data and write to SD
- Displays alcohol sensor data and time to LCD



# Methods



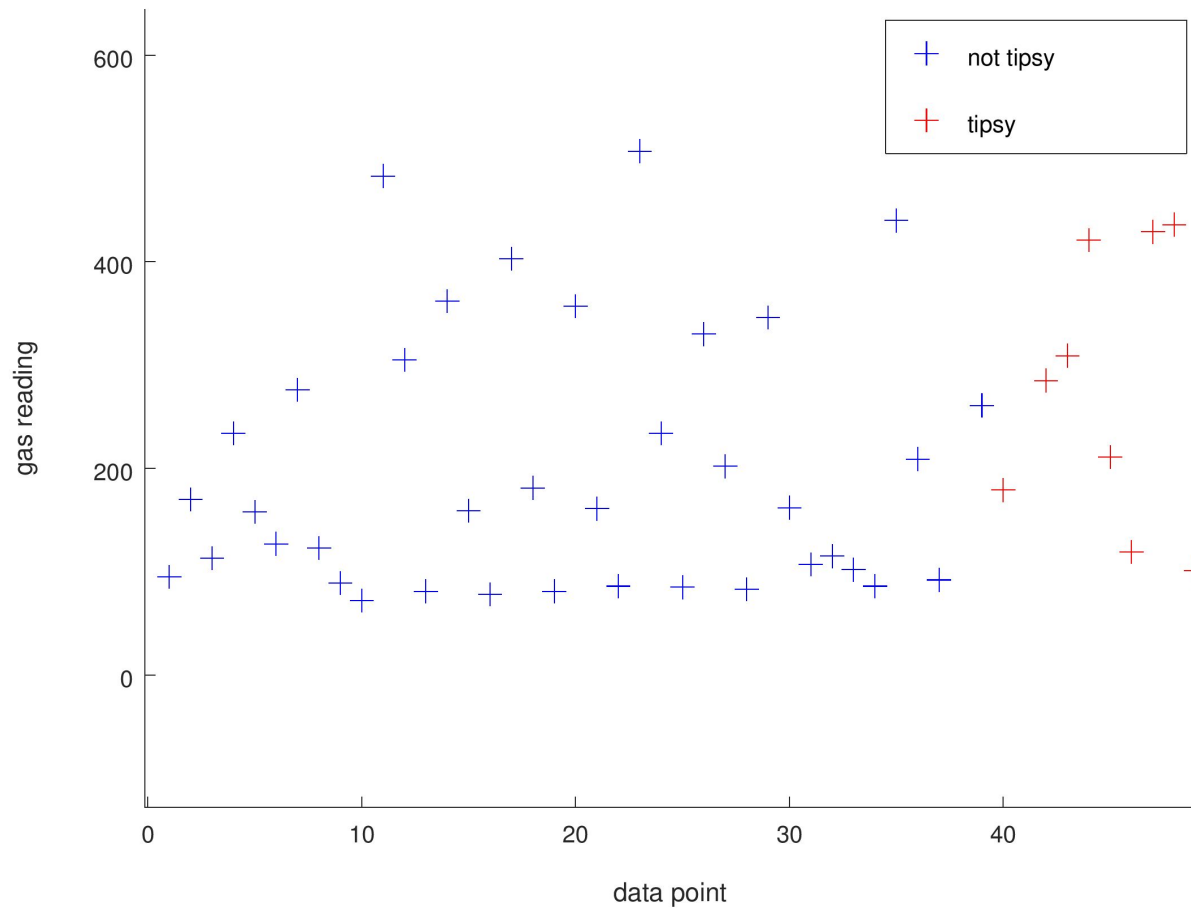




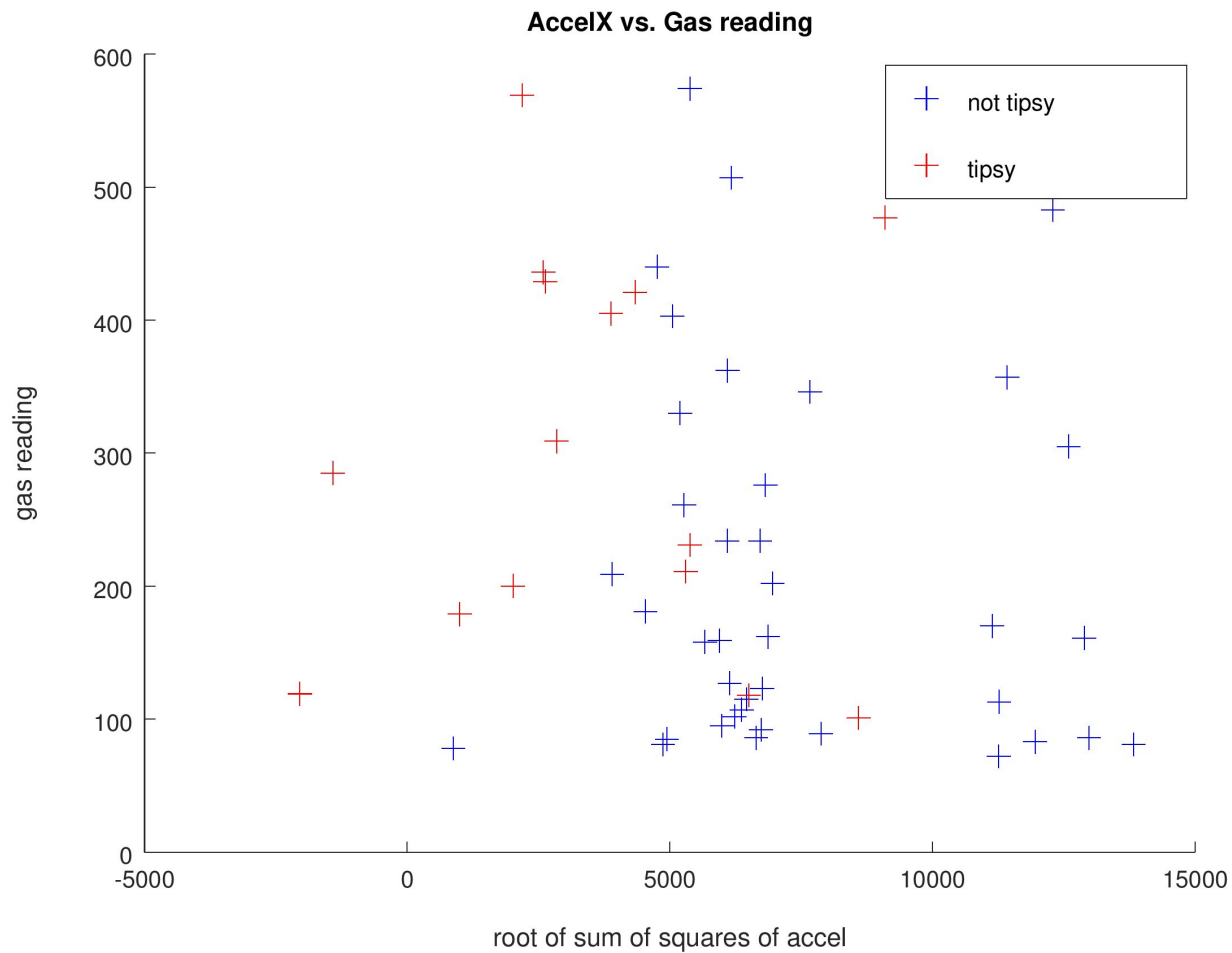


Results

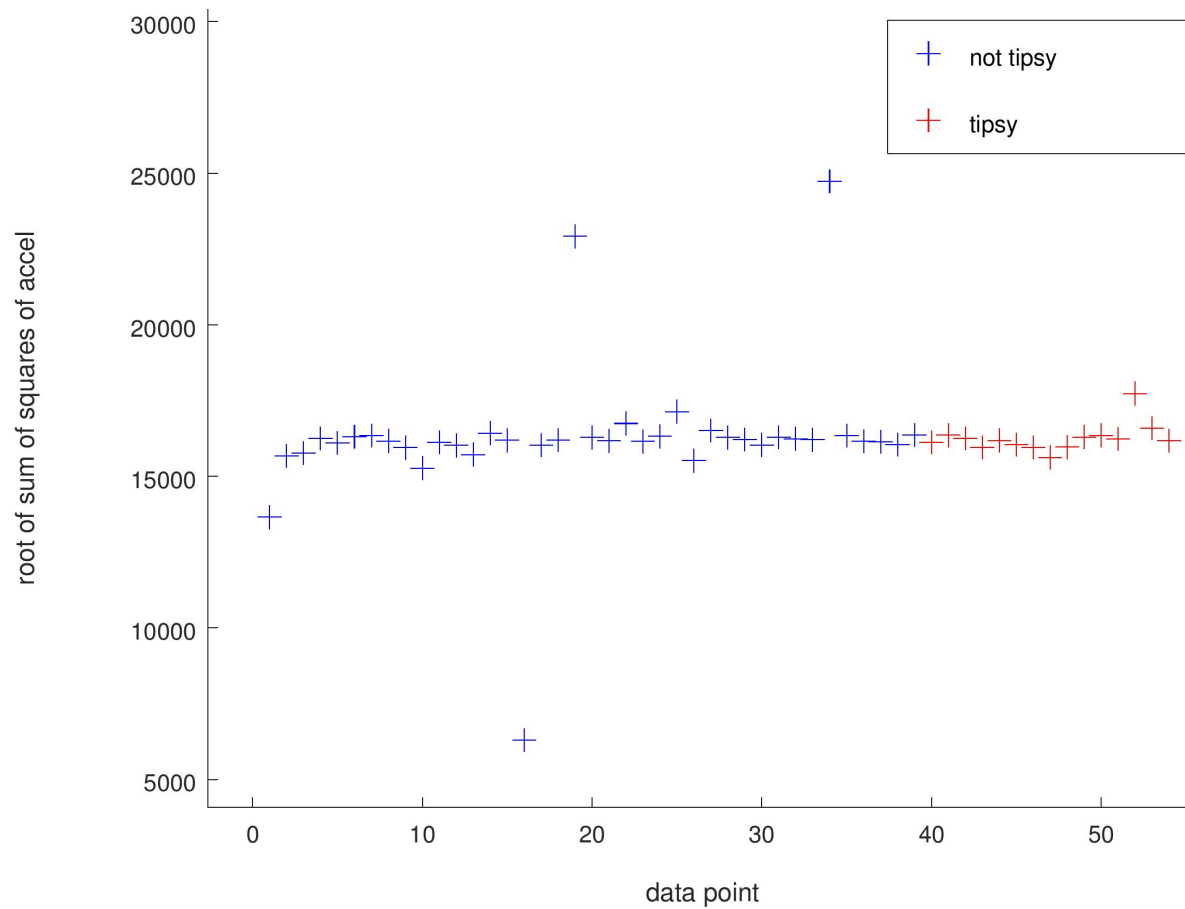
Gas reading vs. Time



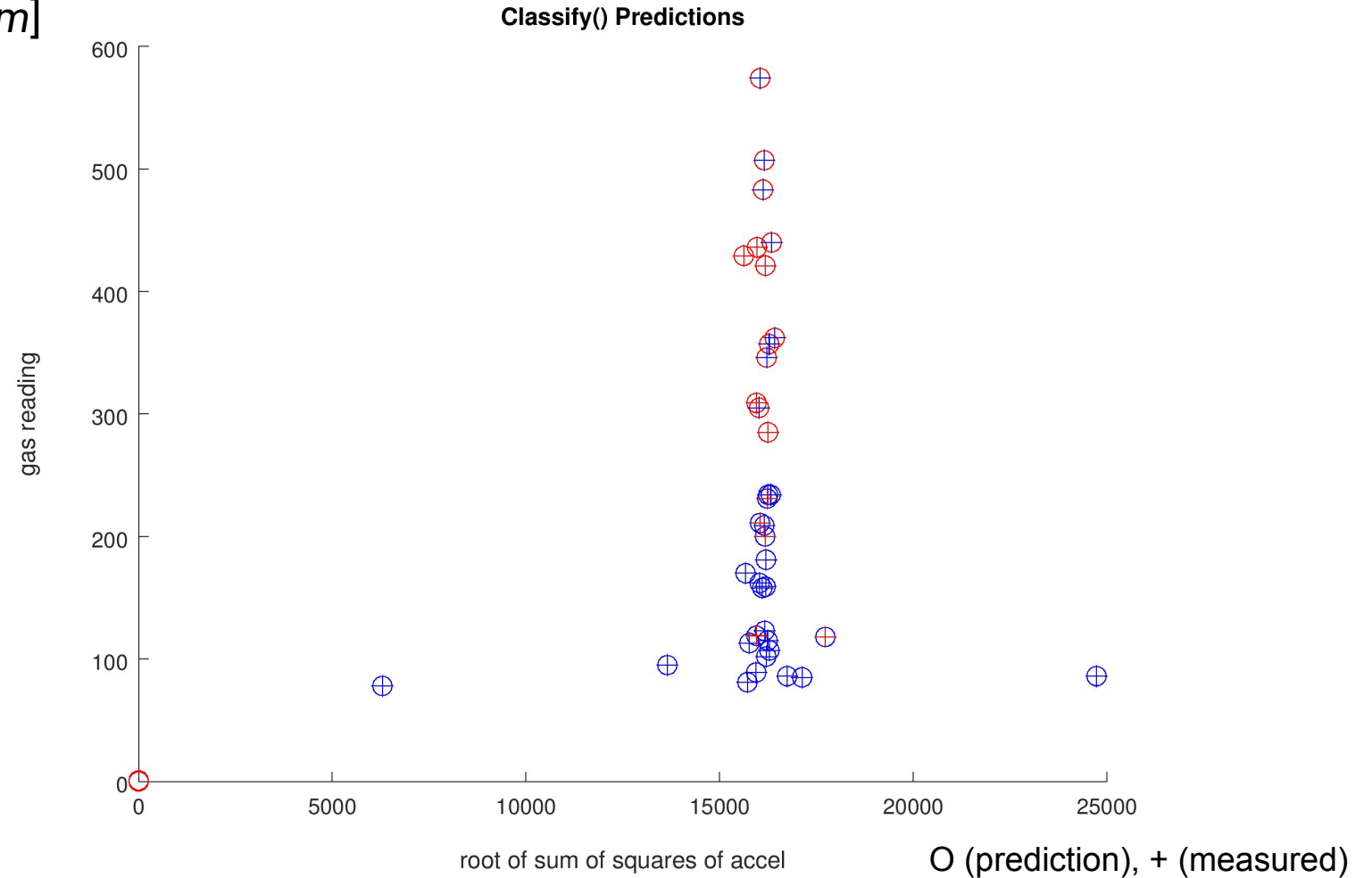




General movement vs. Time



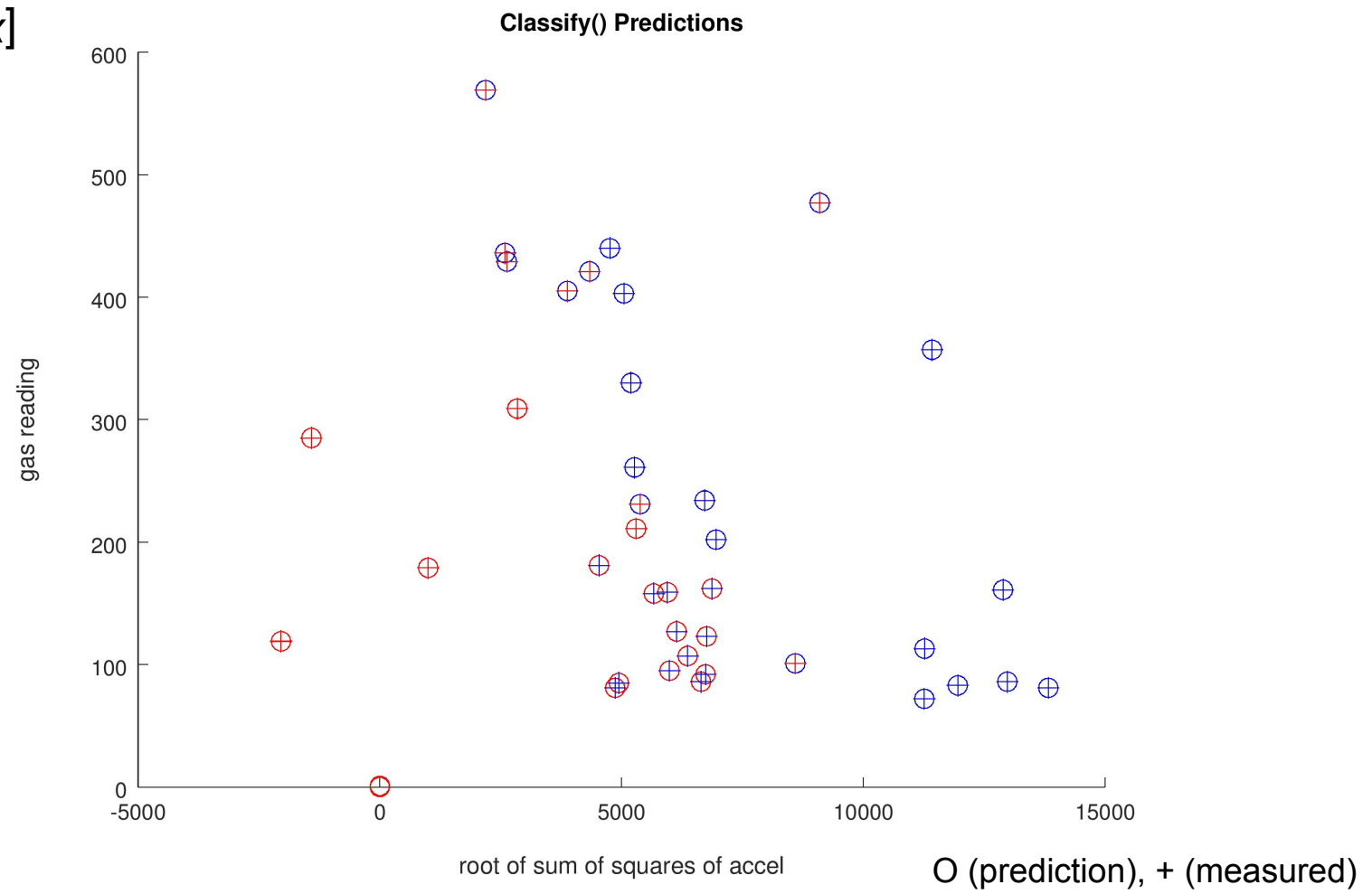
Classify() [a,m]



# Classify() [*a,m*]

	Prediction Positive	Prediction Negative
Condition Positive (isTispy)	5 (True positives)	8 (False negative)
Condition Negative (not Tispy)	5 (False positives)	20 (True negatives)

Classify() [a,x]



# Classify() [a,x]

	Prediction Positive	Prediction Negative
Condition Positive (isTispy)	5 (True positives)	8 (False negative)
Condition Negative (not Tispy)	11 (False positives)	11 (True negatives)



# Conclusions

- Given a small data set commodity hardware can predict intoxication with some degree of accuracy
- Best predictions come from accelerometers x-axis and gas sensor

# Future Work

## Software:

- Improve display message
- Develop a regression model to estimate BAC

## Hardware:

- Add feedback mechanism (a button) to allow for easier acquisition of training set classifiers
- Use a Arduino Mini Pro and better cable management

Questions?