NC STATE UNIVERSITY **Electrical & Computer Engineering**

Project 50

# Non-Intrusive Residential Power Disaggregation

ABB

## Team Members

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## Project Purpose

- Use total power measured in a house to predict individual appliance power use
- Inform the user about their energy usage trends and spending

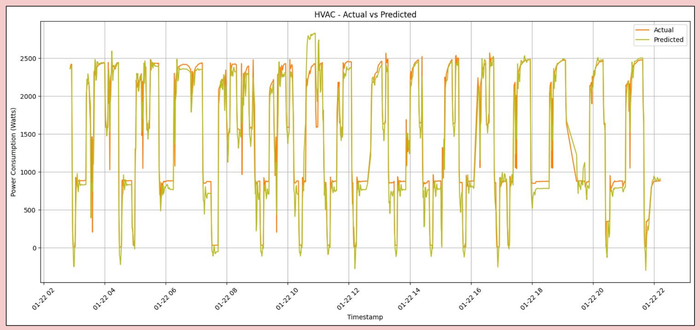
## Key Features

- Device measures total household power usage
- Wireless transmission to database
- Machine learning model disaggregates loads

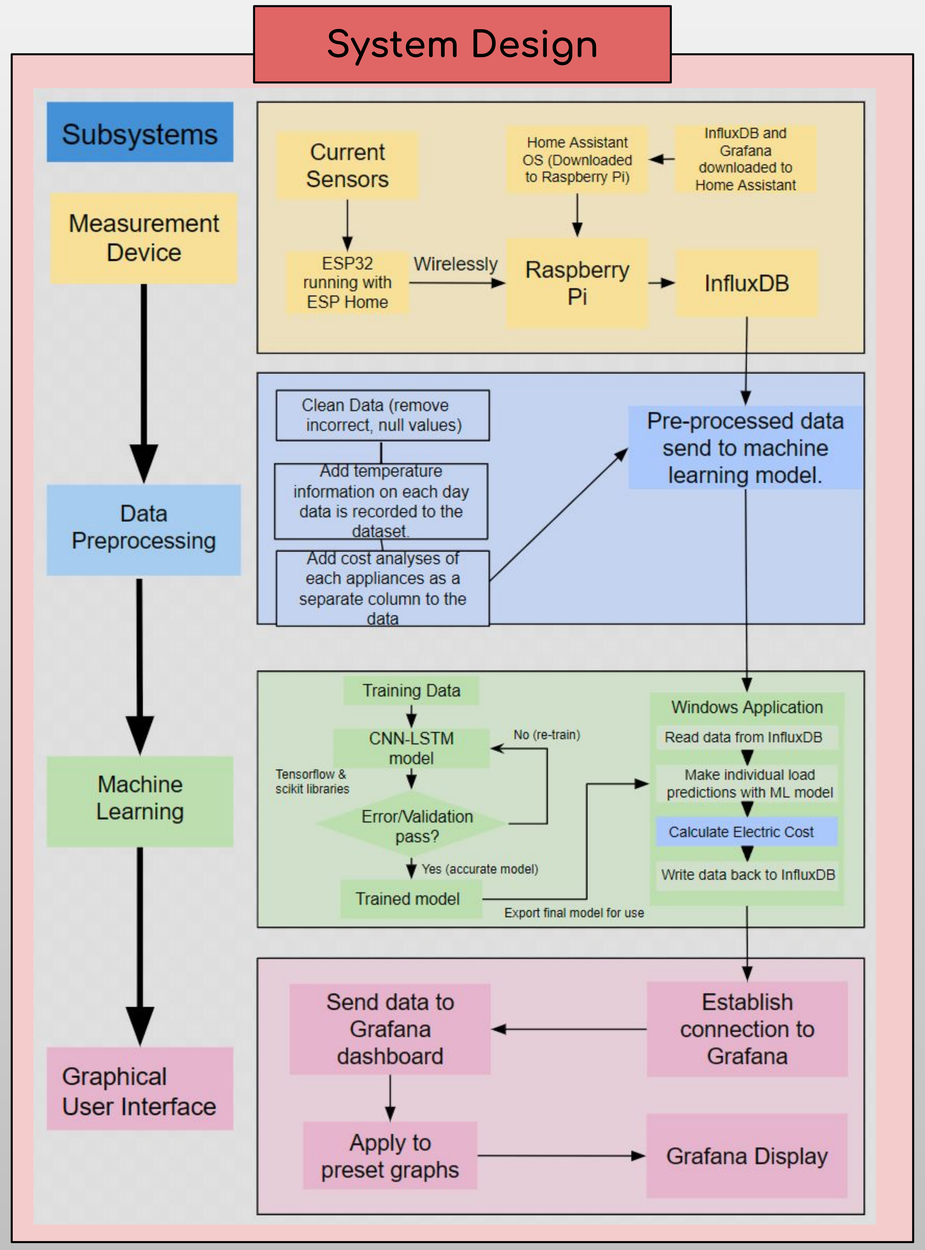
## Requirements

- Inexpensive (less than $100)
- Fits comfortably inside residential breaker panel
- Easy to use graphical interface

## Model Predictions




## System Design




## Design Challenges

- Connecting ESP32 to Homeassistant
- Machine learning accuracy
- Hardware limitations of raspberry pi

## User Interface


## Future Improvement

- Incorporate variable cost calculations
- Allow for remote access
- Make future predictions of power use

## Framework

influxdb python Grafana