

Baseline Goals:

- Single word voice recognition with button press
 - Two words, "Go", "Stop"
 - This can be done entirely without complex ML models
 - Have a constant window across the input and compare with constant sized feature vectors precalculated in MATLAB
- Proper and accurate receiving of data between 32U4 to A7-35T via UART
 - Transmitting gyro and accelerometer readings from 32U4 to A7-35T
 - Transmitting PWM waves and directions from A7-35T to 32U4
- SPI communication between A7-35T and MCP3008
- Feedback loop that provides proportional control
 - Calculating theta from gyro and accelerometer readings
- Feedback loop that provides derivative control
 - Using gyro readings directly to provide feedback
- Simple 1 bit communication between bluetooth modules

Expected Goals:

- Multiword recognition with button press
 - "Go forward", "Turn right" etc.
 - This can probably be done without complex ML models but implementing a HMM at this point might make it a bit easier
- Bluetooth transmit 8 bits at a time
- Execute commands going forwards and backwards

Stretch Goals:

- Continuous voice recognition without button press
- Feedback loop that provides integral control
 - Combine readings from integrating gyro over time as well as wheel encoders
- Execute preset routes (going in a circle, tracing out patterns)
 - Storing and remembering sequences of commands
- Being able to turn the robot while maintaining stability
 - Will require blending of balancing and turning commands