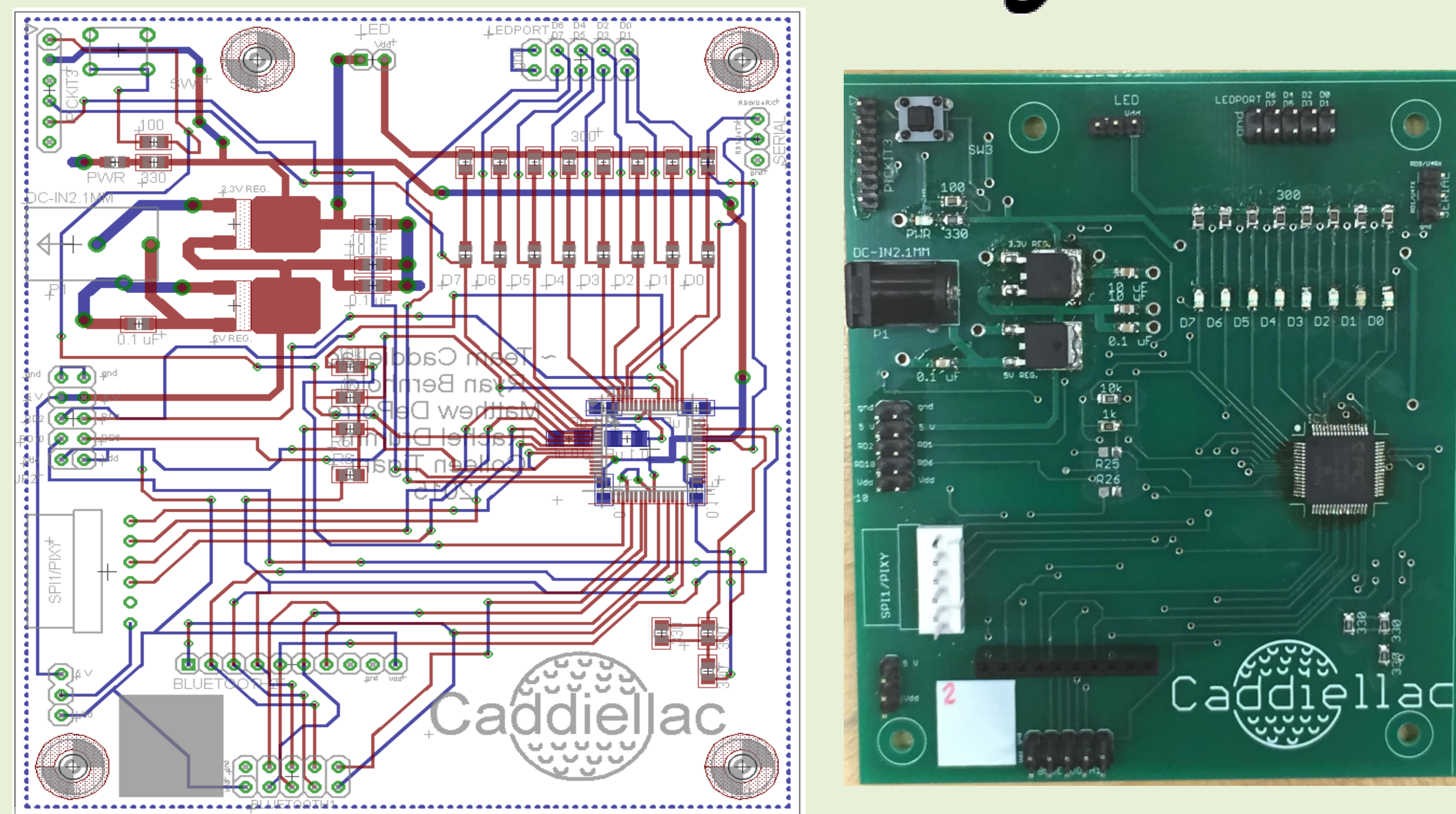


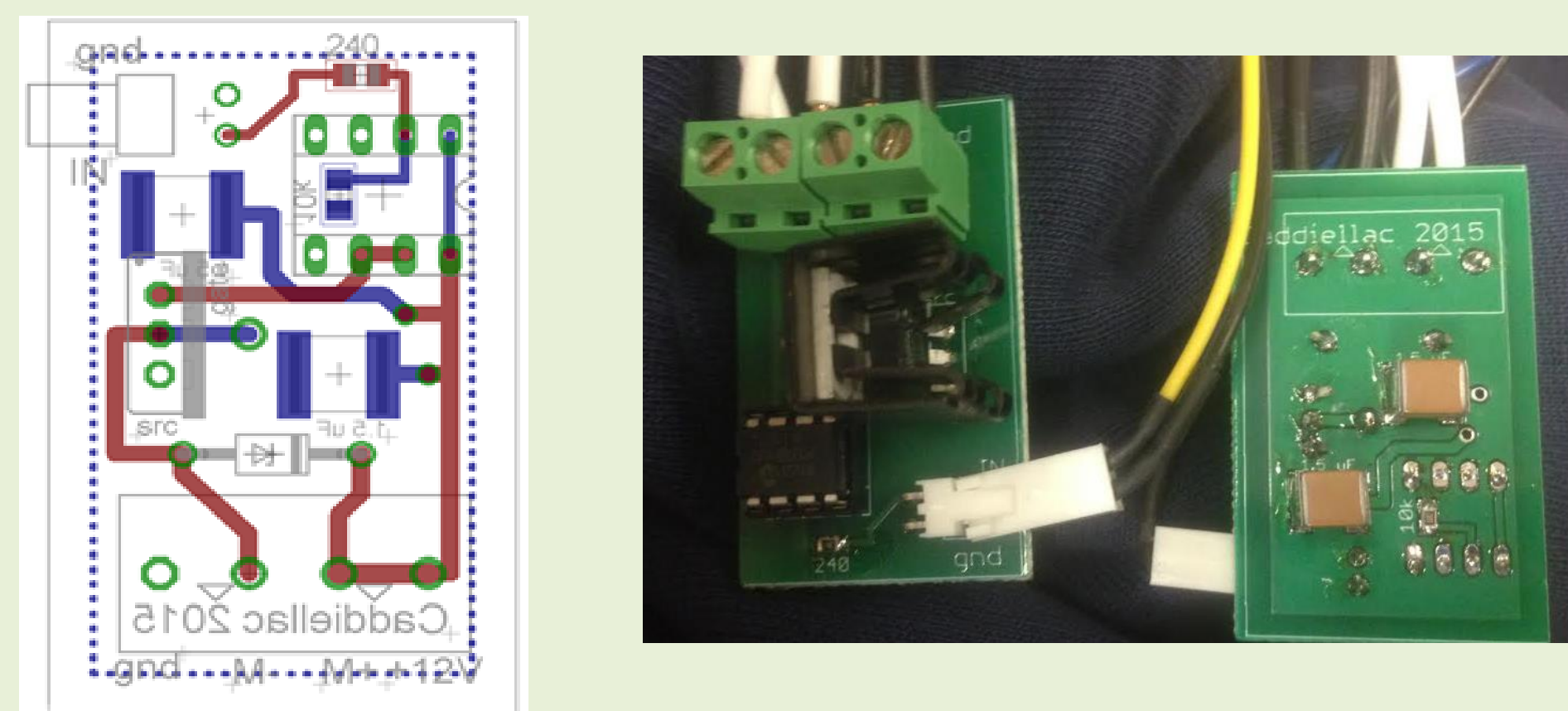


Ryan Bernhold, Matthew DePorre, Rachel Drumm, Colleen Tigani

Board Design



Main Board



Motor Controllers

Main Board Communication Components:

Microcontroller: *PIC32MX795F512H*

2 SPI Ports: *Bluetooth and Pixy*

App Communication: *Bluetooth LE*

Motor Control:

Pulse Width Modulation

Single direction

TC1411N MOSFET driver

IRLB8743 30 V Power MOSFET

Features

Vision System & Collision Prevention

- The Pixy detects the color code on the back of the golfer. The color code information is sent over SPI and used as the default motor control for following the golfer.
- The height dimension of the color code is used to determine whether or not the Caddiellac is too close to the golfer. Also, if the color code is not detected, the Caddiellac will ramp down, preventing collision.

Bluetooth App

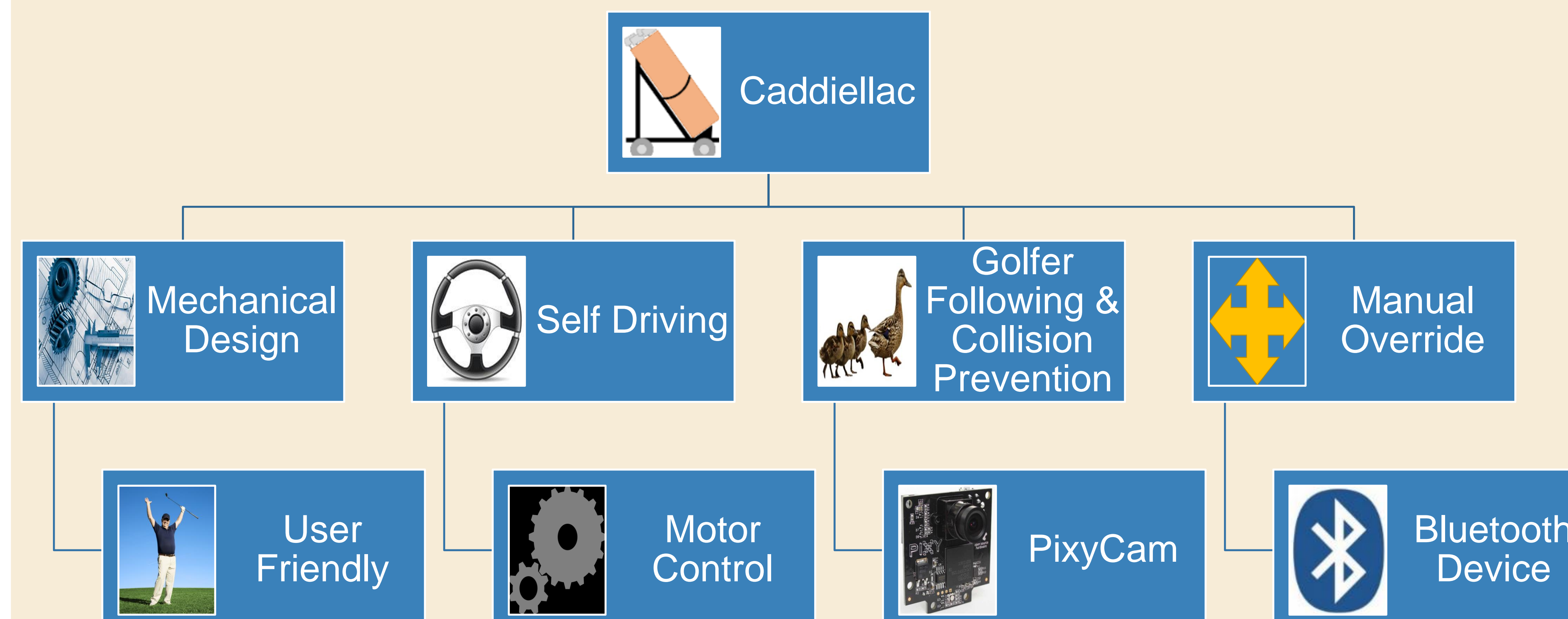
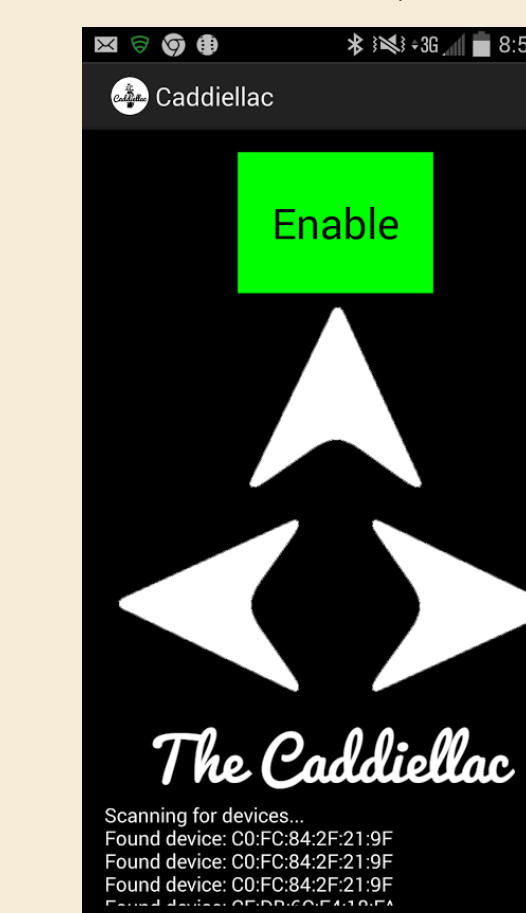
- The app allows the user to manually override the vision and sonar features of the Caddiellac.

Motor Control

- Using a PWM signal, the motor control system adapts with a changing duty cycle depending on the command.

Mechanical Design

- The cart was adapted to hold all of the features of the Caddiellac while still allowing for the best functional design for the golfer.



Testing / Integration

February Subsystem Demo

- Able to connect the kitboard to a BLE application
- Able to control motor speed using PWM signal from MCU on kitboard
- Able to track colors and position using CMU cam5
- Able to track distances using the sonar device

March Subsystem Demo

- Integrate subsystems to work together
- Initial Caddiellac Prototype was able to follow a color code down a hallway in Stinson-Remick Hall, maintaining a safe following distance
- All subsystems functioned together including Bluetooth override and sonar detection.

April Testing

- Board functions successfully with all desired features.
- Streamlined functions with the collision prevention subsystem controlled by the Pixy instead of sonar sensor
- Prototype of mechanical design finalized