# Ecse 211: Design and Principle Methods

Team 5

3nd Week Meeting

# Gantt Chart

# Budget

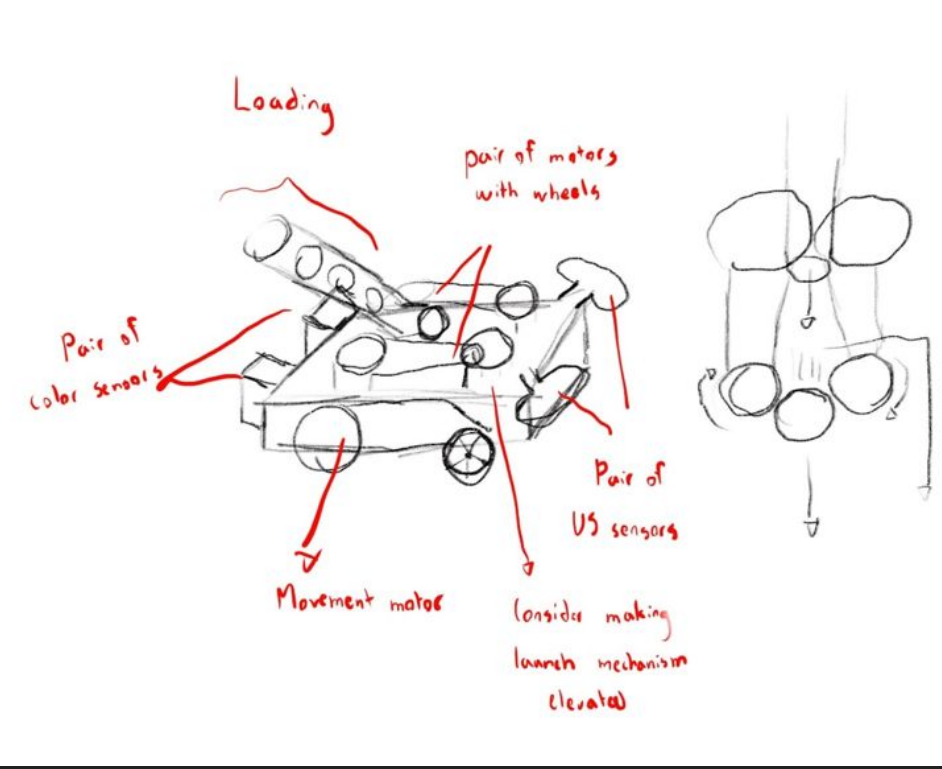
Summary of time and activity

# Documentation updating

- Updated hardware design document
- Updated testing document
- Updated software document

# Mechanical design proposal

# Present version




Description:

- 2 color sensors on the back to correct localization angle while navigating
- 2 US sensors at 45 degrees on each side to detect obstacles
- 2 large motors for movement
- 2 large motors for launching

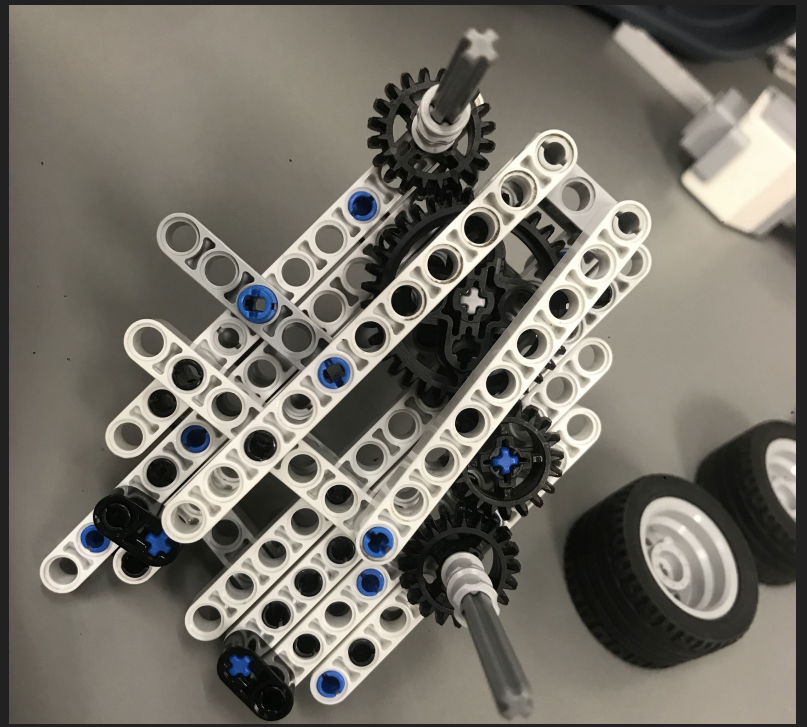
Strengths:

- Compact size, minimum pieces
- Gravity loading mechanism, no motors required
- Stable launches without need of additional weights
- Precise localization and navigation

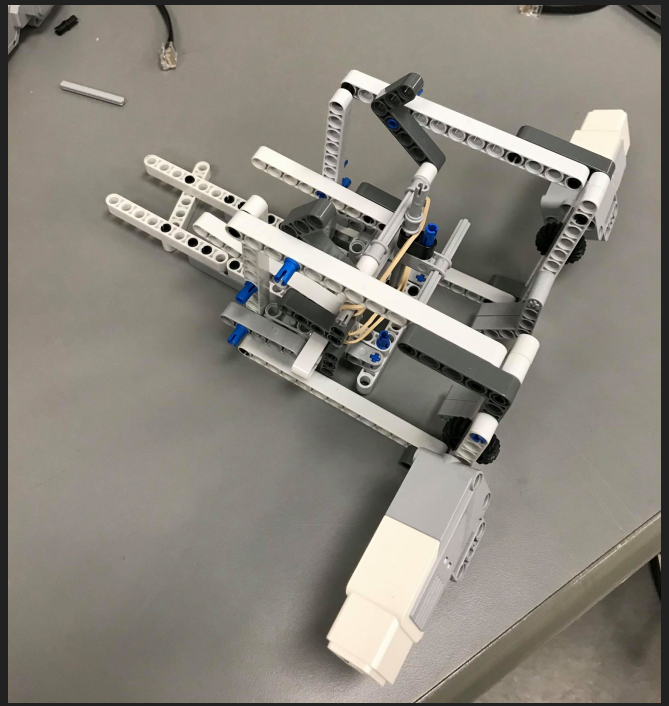
Weaknesses:

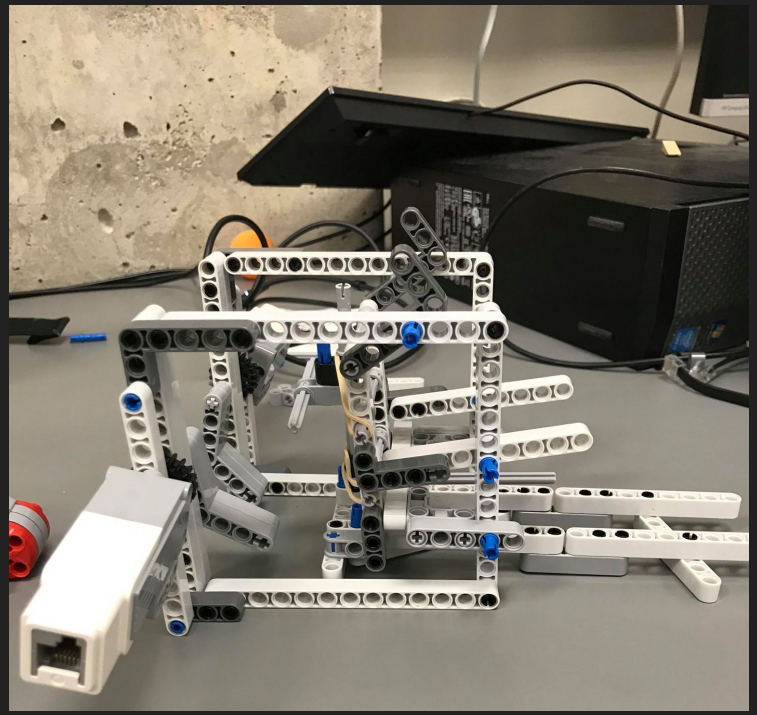
- Cannot detect front obstacles
- Prototype launcher
- Cannot see test data on the display

# Final design 1



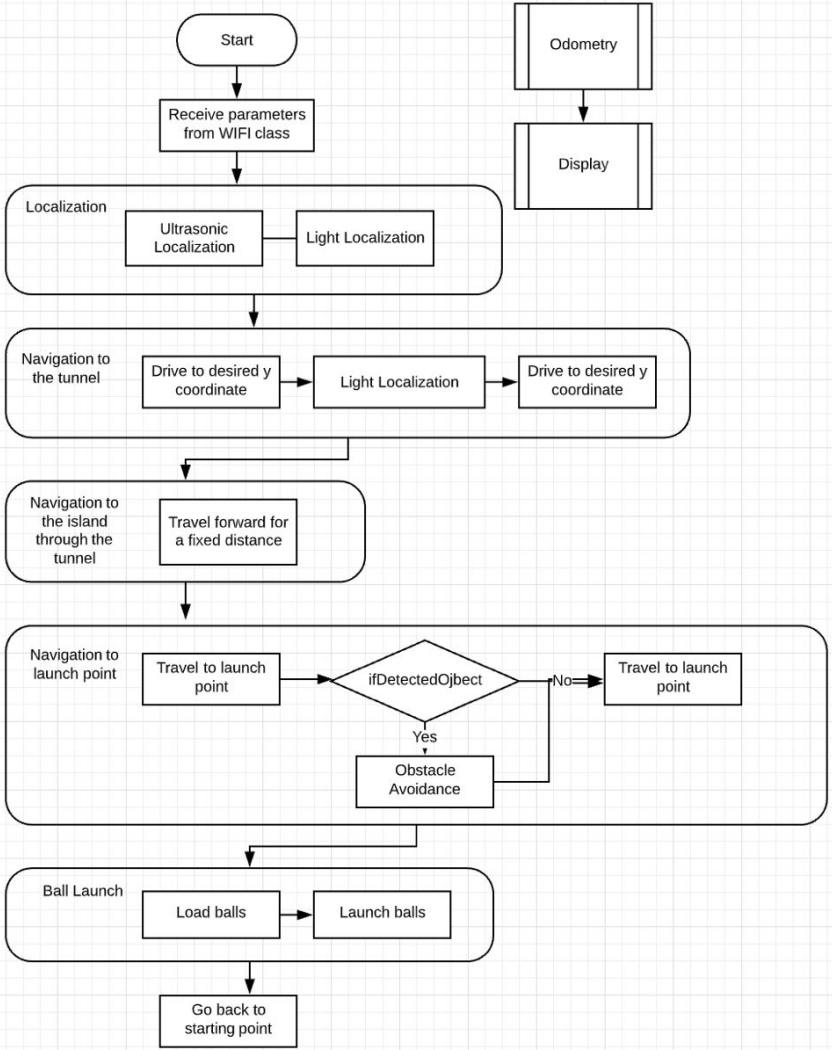
# Final Design 2





# Software Architecture

# Flow Chart



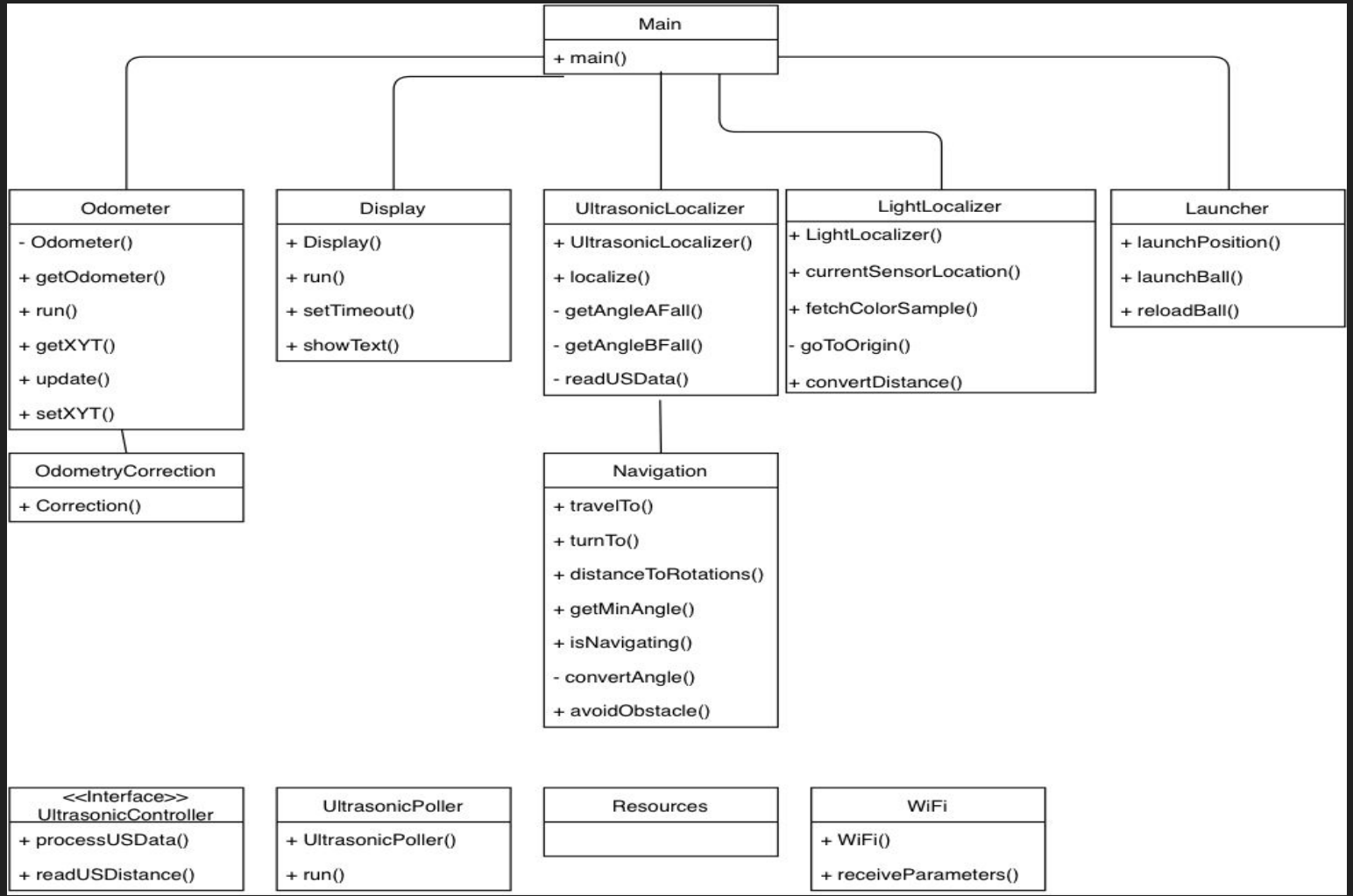

Note:

1. Localizing classes run as threads while robot is navigating

2. While navigating the launching position, avoid obstacles using a predetermined path of avoidance, set more edge cases if two robots meet each other.

3. Use two light sensors to correct the orientation while navigating

# Class Hierarchy Diagram

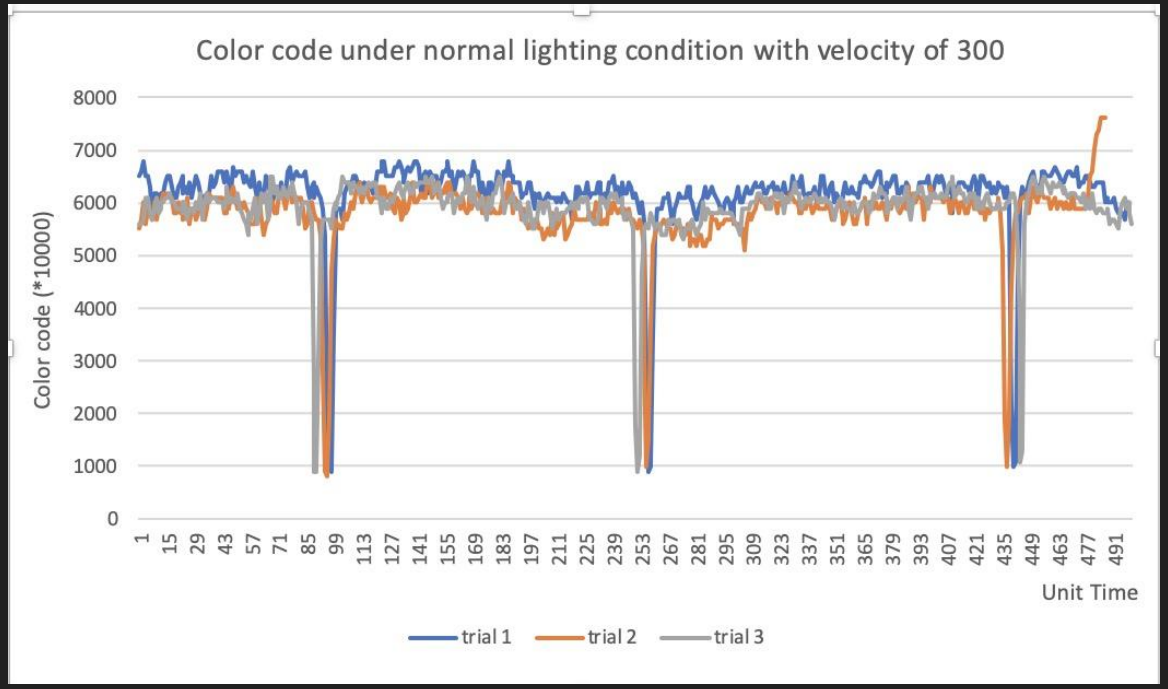

Main
+ main()
Odometer
- Odometer()
+ getOdometer()
+ run()
+ getXYT()
+ update()
+ setXYT()
Display
+ Display()
+ run()
+ setTimeout()
+ showText()
UltrasonicLocalizer
+ UltrasonicLocalizer()
+ localize()
- getAngleAFall()
- getAngleBFall()
- readUSData()
LightLocalizer
+ LightLocalizer()
+ currentSensorLocation()
+ fetchColorSample()
- goToOrigin()
+ convertDistance()
Launcher
+ launchPosition()
+ launchBall()
+ reloadBall()
OdometryCorrection
+ Correction()
Navigation
+ travelTo()
+ turnTo()
+ distanceToRotations()
+ getMinAngle()
+ isNavigating()
- convertAngle()
+ avoidObstacle()
<<Interface>>
UltrasonicController
+ processUSData()
+ readUSDistance()
UltrasonicPoller
+ UltrasonicPoller()
+ run()
Resources
WiFi
+ WiFi()
+ receiveParameters()

# API docs

# Status of code

# Test Plans

- Updated sensor calibration result



# To do during week 4

- The beta demonstration
- Milestone demo document
- Hardware development
- Software development
- Test document (beto demo, test for last version on both hardware and software)