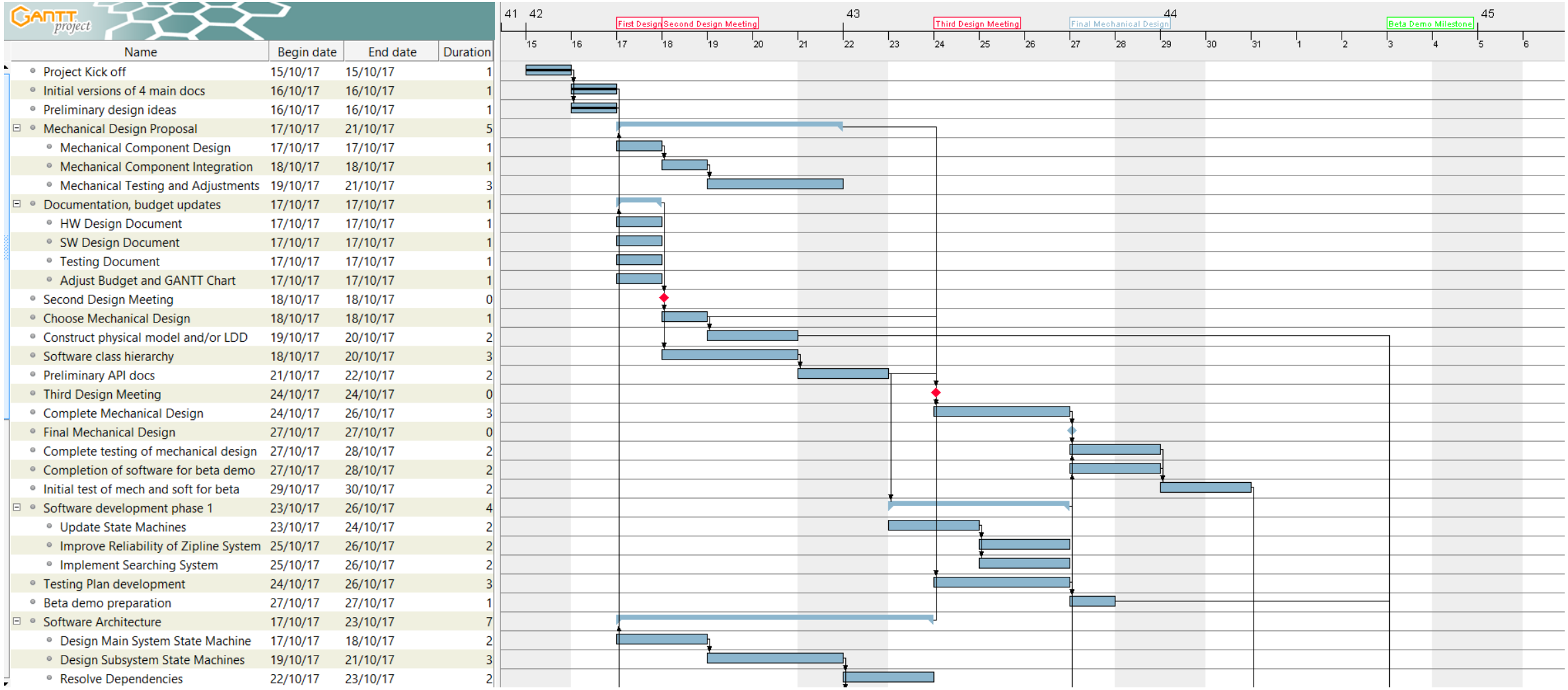
Meeting Three

DPM Final Project
Fall 2017
Team 6

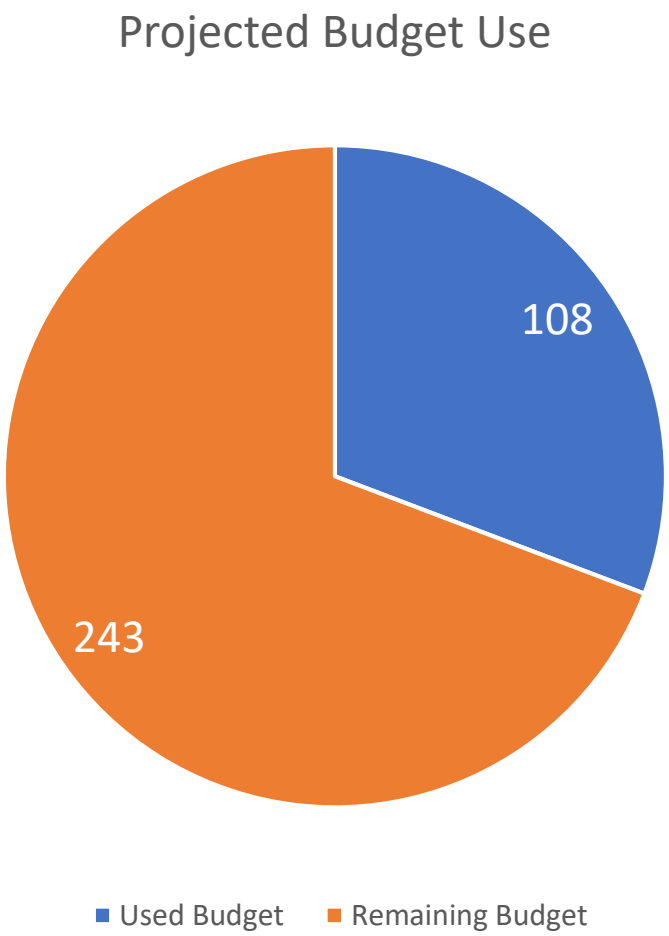
GANTT and budget review, mechanical design presentation, software architecture overview, and testing status

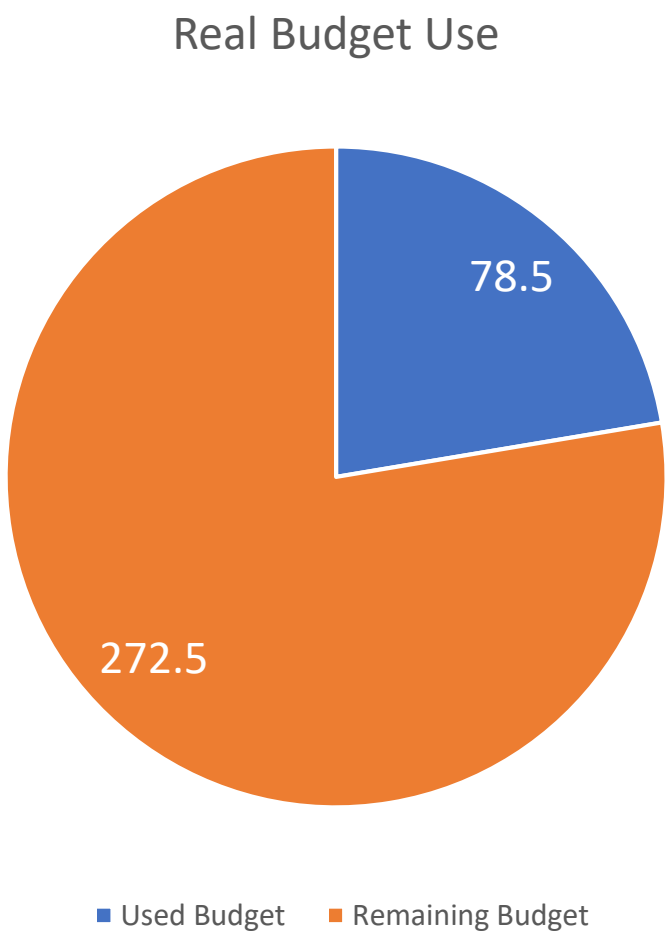
GANTT Chart Update



Name	Begin date	End date	Duration
Project Kick off	15/10/17	15/10/17	1
Initial versions of 4 main docs	16/10/17	16/10/17	1
Preliminary design ideas	16/10/17	16/10/17	1
Mechanical Design Proposal	17/10/17	21/10/17	5
Mechanical Component Design	17/10/17	17/10/17	1
Mechanical Component Integration	18/10/17	18/10/17	1
Mechanical Testing and Adjustments	19/10/17	21/10/17	3
Documentation, budget updates	17/10/17	17/10/17	1
HW Design Document	17/10/17	17/10/17	1
SW Design Document	17/10/17	17/10/17	1
Testing Document	17/10/17	17/10/17	1
Adjust Budget and GANTT Chart	17/10/17	17/10/17	1
Second Design Meeting	18/10/17	18/10/17	0
Choose Mechanical Design	18/10/17	18/10/17	1
Construct physical model and/or LDD	19/10/17	20/10/17	2
Software class hierarchy	18/10/17	20/10/17	3
Preliminary API docs	21/10/17	22/10/17	2
Third Design Meeting	24/10/17	24/10/17	0
Complete Mechanical Design	24/10/17	26/10/17	3
Final Mechanical Design	27/10/17	27/10/17	0
Complete testing of mechanical design	27/10/17	28/10/17	2
Completion of software for beta demo	27/10/17	28/10/17	2
Initial test of mech and soft for beta	29/10/17	30/10/17	2
Software development phase 1	23/10/17	26/10/17	4
Update State Machines	23/10/17	24/10/17	2
Improve Reliability of Zipline System	25/10/17	26/10/17	2
Implement Searching System	25/10/17	26/10/17	2
Testing Plan development	24/10/17	26/10/17	3
Beta demo preparation	27/10/17	27/10/17	1
Software Architecture	17/10/17	23/10/17	7
Design Main System State Machine	17/10/17	18/10/17	2
Design Subsystem State Machines	19/10/17	21/10/17	3
Resolve Dependencies	22/10/17	23/10/17	2

Budget Update

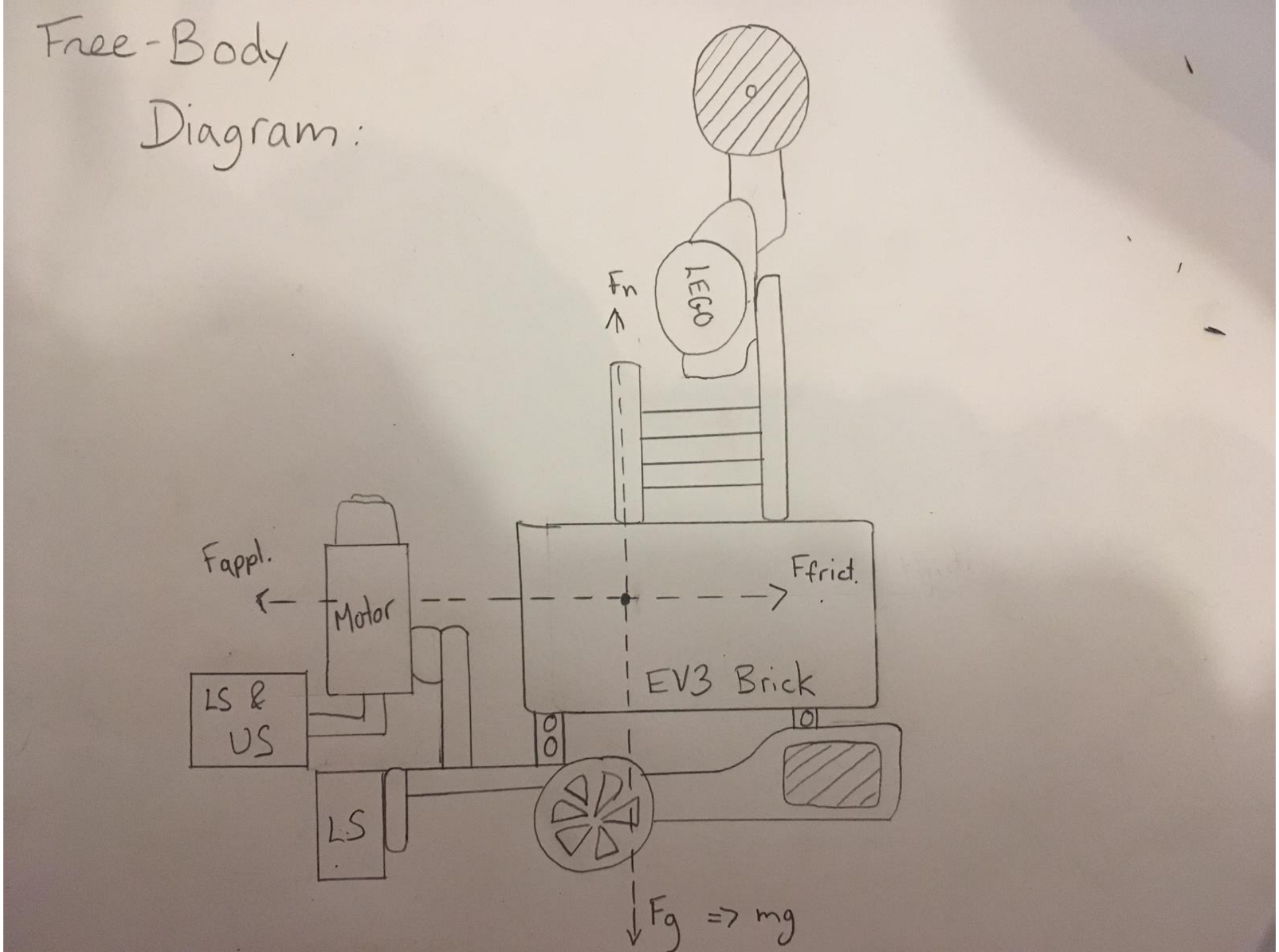




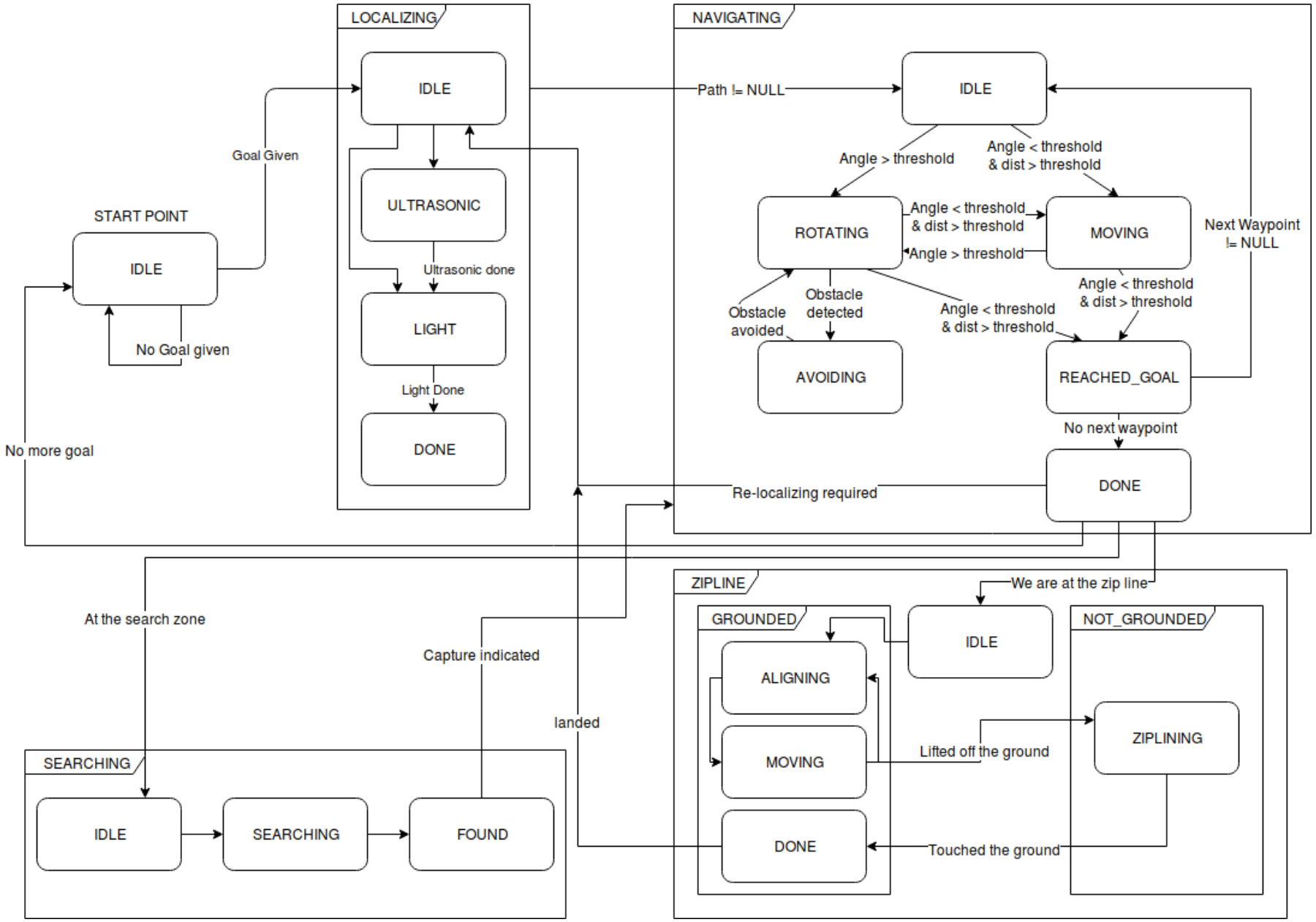
Mechanical Design Selection

Physical Characteristics
SENSORS: - 3x colour sensor - 1x ultrasonic sensor
MOTORS: - 2x large EV3 motor - navigation - 1x large NXT motor – zipline pulley operation - 1x medium motor – sensor rotation
MEASUREMENTS: - wheelbase: 15.2 cm - width: 19.8 cm - height: 28.5 cm - depth: 21.2 cm
Easily accessible battery
Stable on the ground and on the zip line due to calibrated centre of gravity

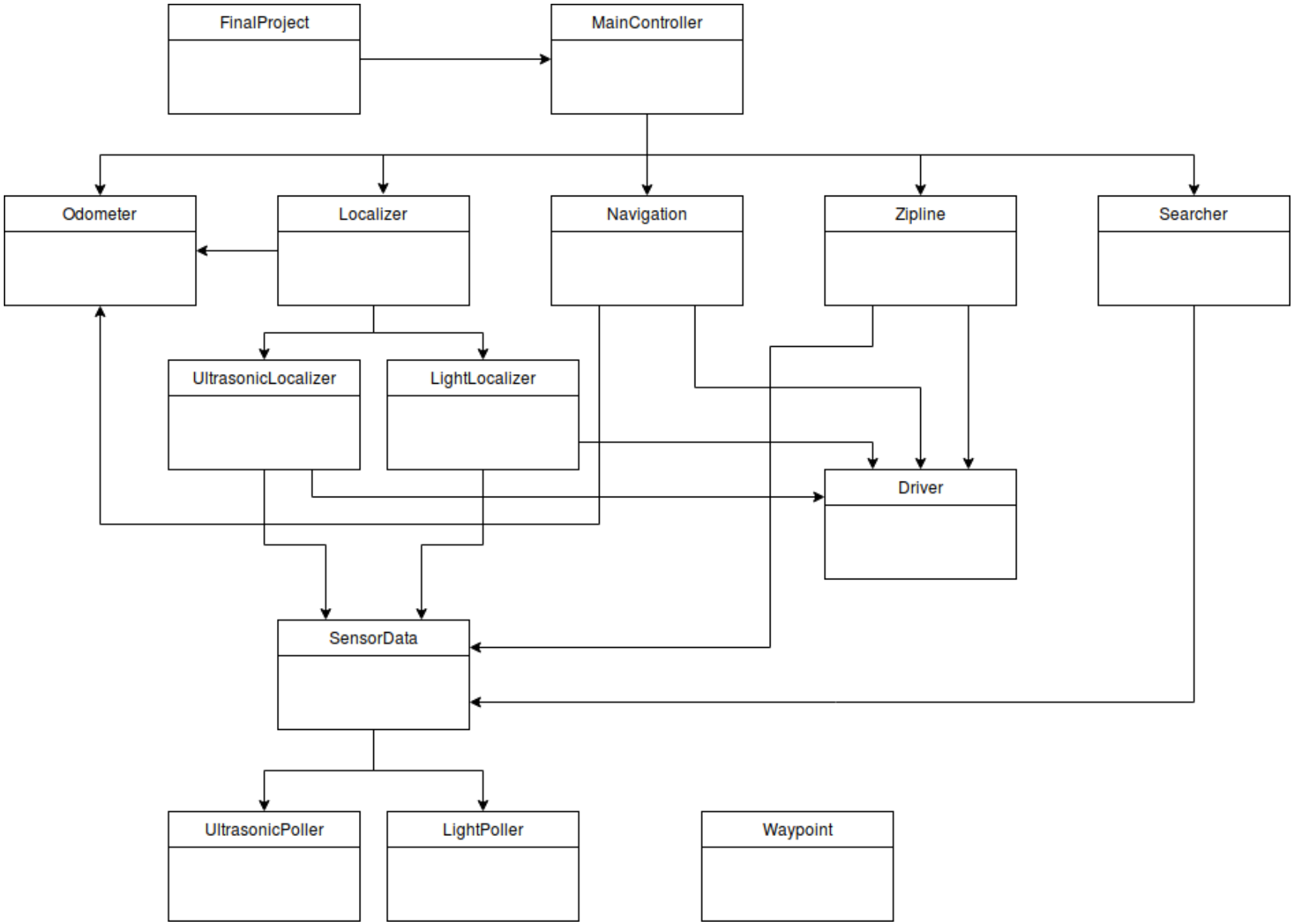
PROS	CONS
Both the ultrasonic and light sensors positioned in front are low enough.	No remaining ports for gyro sensor.
The ultrasonic and colour sensors can be moved.	The stability of the pivoting sensors should be revised.
Good accessibility to the battery.	
The width of the wheels make the robot stable but can also execute tight turns.	


Free-Body
Diagram:
Fn
LEGO
Fappl.
Motor
Ffrict.
EV3 Brick
LS &
US
LS
Fg => mg

Software Architecture – Updated State Machine



Software Architecture – Updated Class Hierarchy



Testing Status

- Testing document has been updated after each test. A copy of the document is uploaded weekly to the Dropbox.
- For each test, the following details are noted:
  - Date
  - Testers
  - Hardware and Software Versions
  - Goal
  - Procedure
  - Expected Result
  - Test Report
  - Conclusion
  - Action and Distribution
- Tests have been conducted in the following areas:
  - Stability of robot (driving and ziplining)
  - Mounting and dismounting of zip line
  - Accuracy of navigation and localization

Week 3 Plan

- Prepare for milestone demonstration
  - Characterize available sensors and motors to choose those that perform best
  - Construct the robot that will be used for the demonstration
  - Complete the first version of the code base
  - Conduct tests to ensure that the robot will meet the demonstration criteria
- Update GANTT chart and budget
- Update documentation with the latest details for Monday’s submission