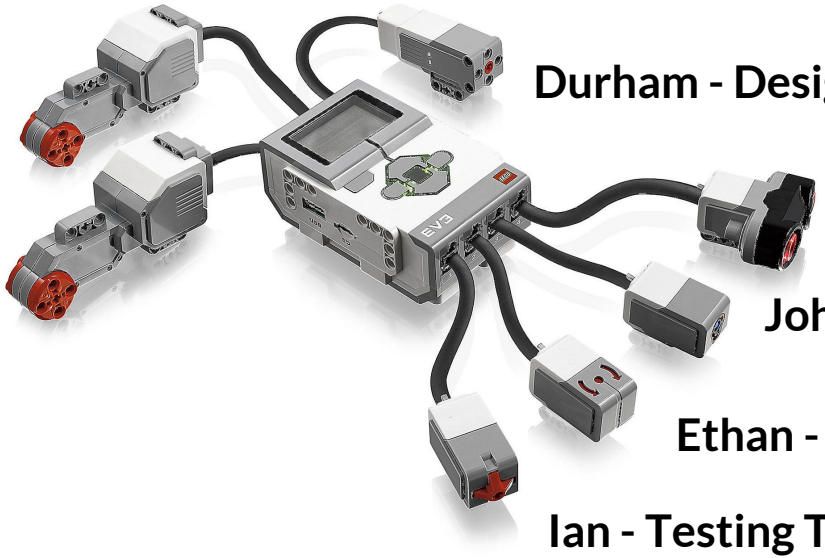
DPM Design Group 11:

Alex Durham
Ethan Ian
John

ECSE-211: Design Principles & Methods

Design Project

Introduction



Durham - Design Team Manager

Alex - Documentation Manager

John - Software Team Leader

Ethan - Hardware Team Leader

Ian - Testing Team Leader

Capabilities

Team Positions:

- **Durham**
  Design team leader: Experience in budgeting, managing projects
- **Alex**
  Documentation manager: Experience in LaTex and high quality writer.
- **John**
  Software team leader: Interned as software developer, hackathon enthusiast,
- **Ethan**
  Hardware team leader: Built hardware based personal projects directly relating to this
- **Ian**
  Testing team leader: Experience in gathering, analyzing, automating data.

Requirements

- ➔ Mobility in Field
- ➔ Ball Manipulation
- ➔ Defense

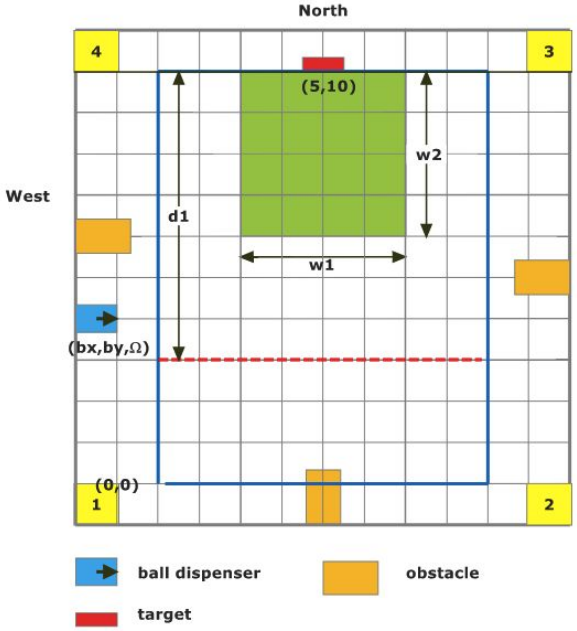
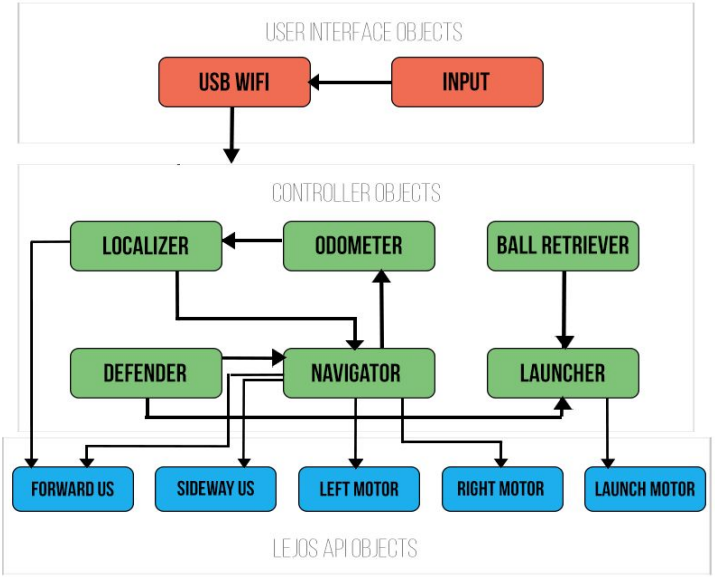


Figure 1

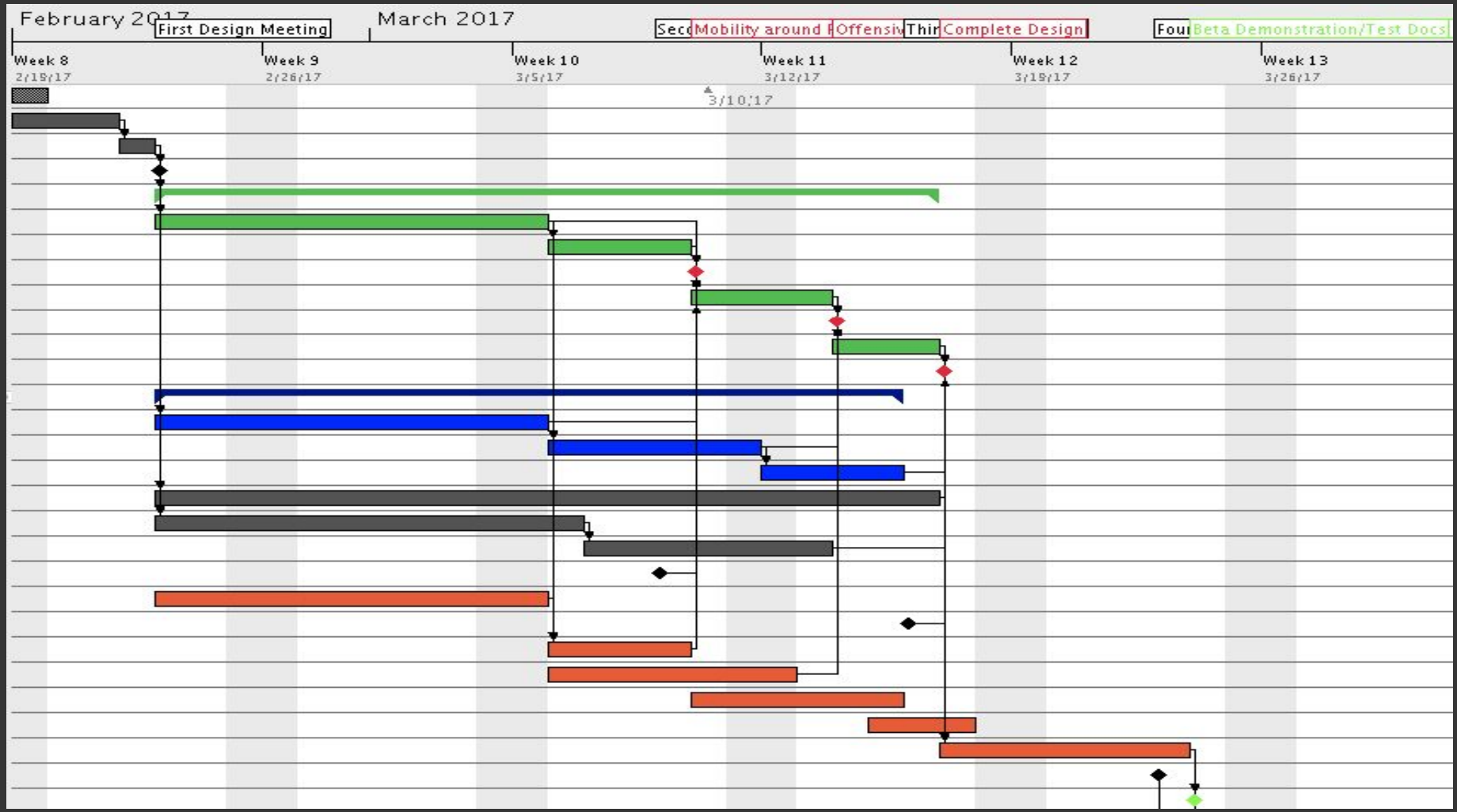
Constraints

- **Budget:**
  - 270 hours
- **Equipment (Hardware/Software)**
- **Delivery Date**
  - Target: March 31

System



- → Tools
- → Hardware
- → Software


February 2017
First Design Meeting
March 2017
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Complete Design
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Beta Demonstration/Test Docs
Week 8
2/19/17
Week 9
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Week 13
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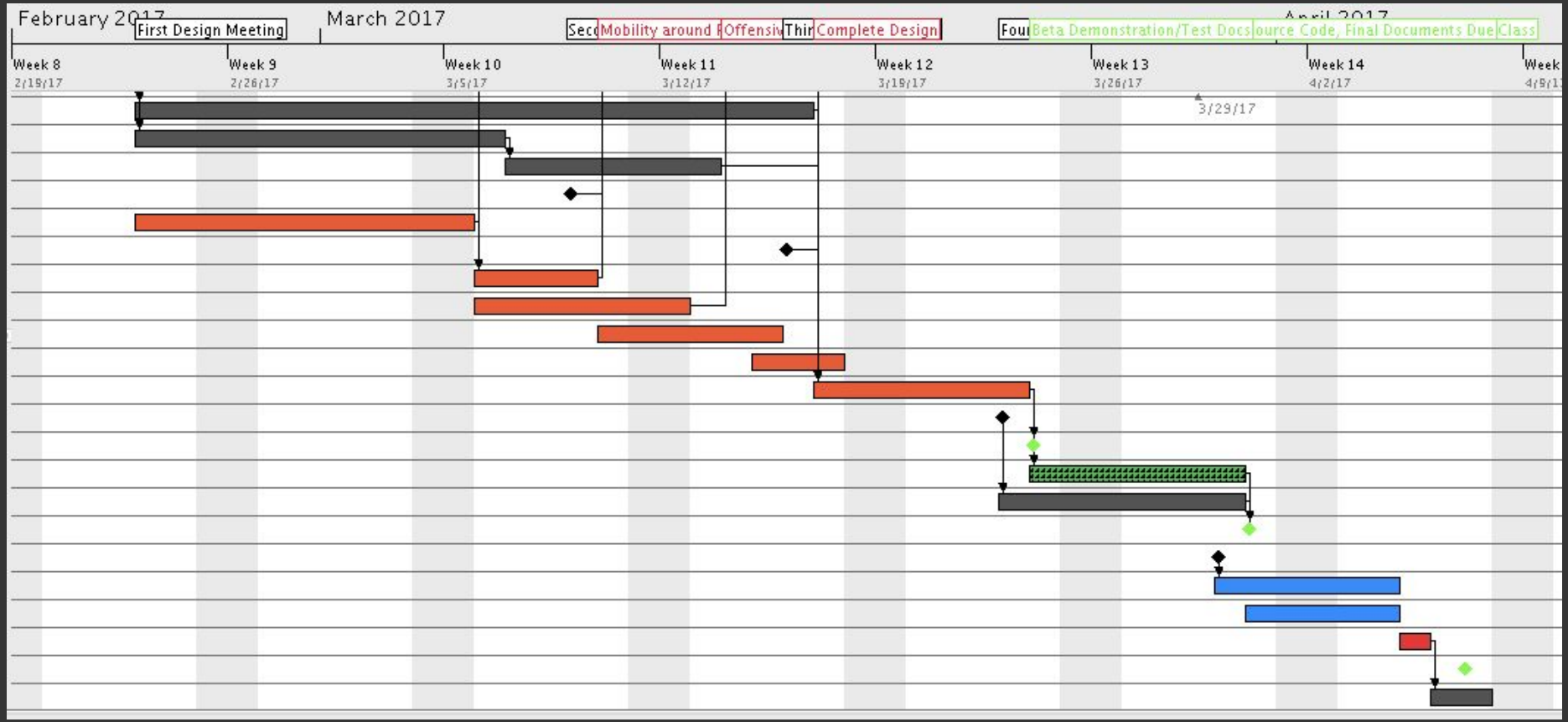
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2/26/17
Week 10
3/5/17
Week 11
3/12/17
Week 12
3/19/17
Week 13
3/26/17
Week 14
4/2/17
3/29/17

Key Dates: Functionality + Testing

Planning + Basic Robot

Put in place the infrastructure to begin designing the robot

March 17

Complete mechanical design- begin integrative testing

March 31

Finalize design features, begin final documentation

March 6

Begin testing of robot's mobility: odometry, navigation, obstacle avoidance

March 24

<u>Functional prototype:</u>

Localize, navigate, avoid obstacles, retrieve + throw ball

Key Dates: Agile Design Process

- March 10: Mobility in field
- March 14: Ball retrieval + throwing
- March 17: Complete software/hardware designs
- March 17-23: Integrative testing + updates
- March 24: Full prototype + Demo

Initial Design Ideas:

1. High priority on localization/navigation
2. Simple, fast robot
3. Throwing arm perpendicular to velocity
4. 3 ultrasonic sensors (1 localization, 3 obstacle avoidance)
5. Battery-dependent power output to motors

Questions

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