YO//O

One bot to rule them all

DPM W'15 Team 18

- Bobak Baghi (Software)
- Clara Dionet (Testing)
- Josh Donath (Management)
- Mathieu Pigeon (Testing / Hardware)
- Musa Shakib Khan (Documentation)

About Yo//o

Yo//o came to be as a combination of our love for robotics, simplicity, and efficient design.

Our objectives for this project was to design a robot which would be able to fulfill the requirements shown below, while remaining compact, efficient, and stylish — as can be ascertained by our almost exclusive use of lego parts in the design.
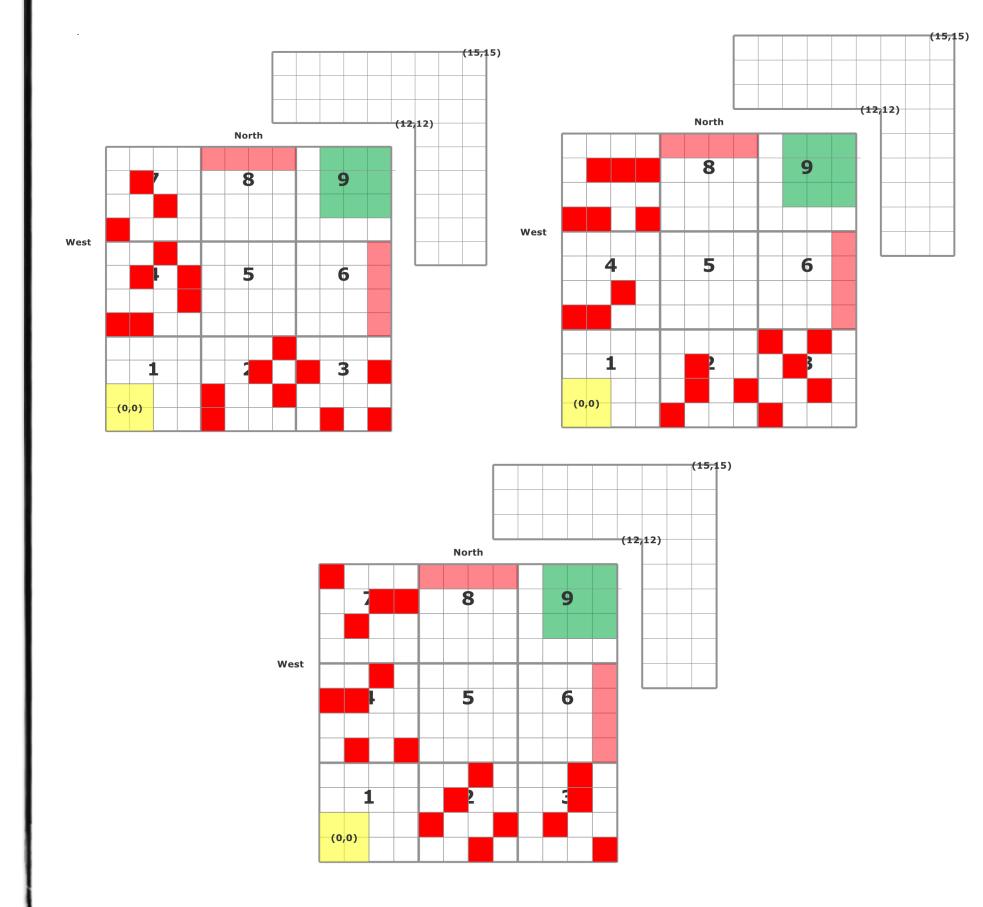
Objectives

Specifications

In order to succeed, Yo//o needed to be able to complete the following tasks:
- Localize itself when placed on the competition field
- Navigate through a pre-defined maze (see maps)
- Shoot at a target
- Return to its starting point

Competition maps

Each tile represents a 30cm x 30cm, meaning the obstacles are of the same dimension. This constrained the potential dimensions of our robot to be of that size, to allow seamless navigation through the obstacle path.
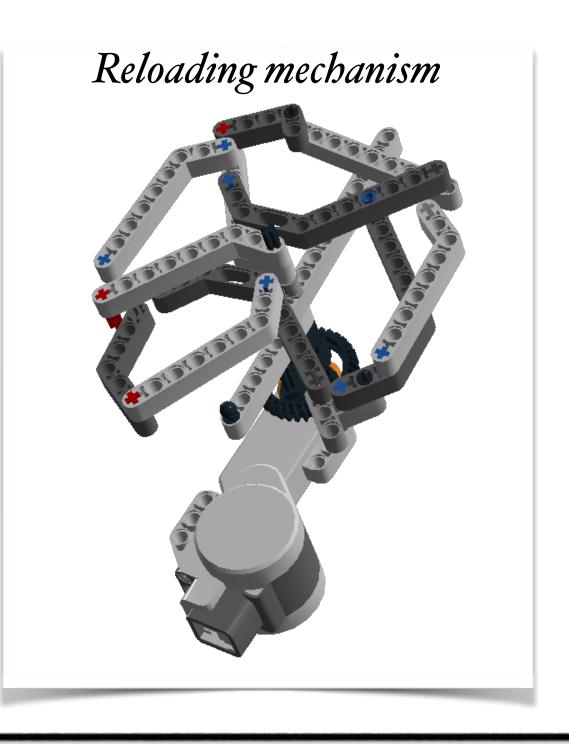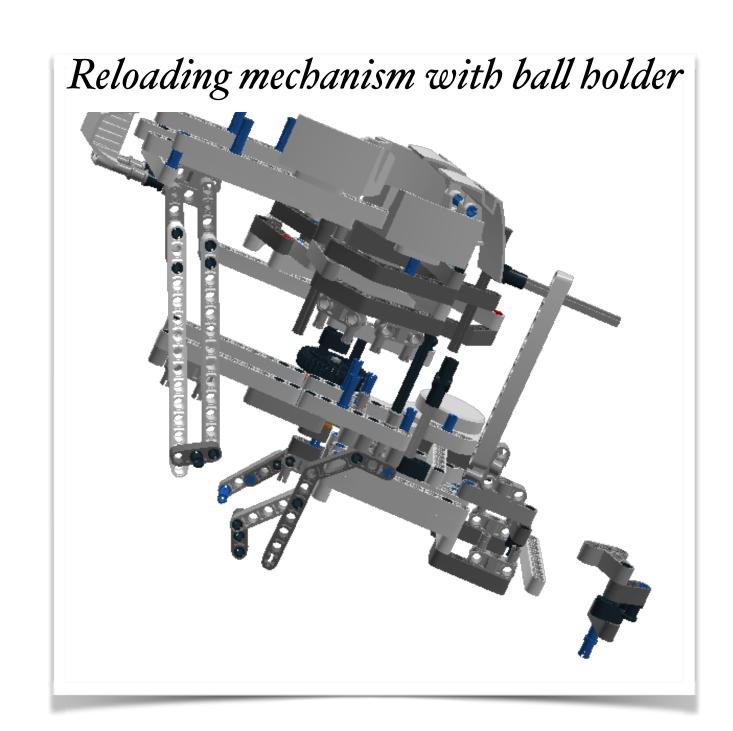
Software

Design / Specs

Our design, pictured on the right of the poster, favors simplicity by using one NXT brick. This was accomplished by designing a custom launcher design which would allow to use a single motor for both the loading and shooting action of the launcher.

The launcher uses a 'flicker' mechanism to launch balls. It has 2 pieces attached on a rotating pole. These two pieces are also connected with an elastic. The longer of two pieces hits a stationary pole periodically, creating tension in the elastic, and simultaneously drawing back the long piece, effectively creating a collision and consequentially launching the ball once per cycle (i.e. 360° rotation).

The reloader comes in the form of a disk with a wedge taken out, allowing a ball to pass through the mechanism once per cycle. Note that the wedge is slightly off center and not a perfect circle.

Reloading mechanism

Reloading mechanism with ball holder

Team / Materials Budget

Every team members were given a time budget of 9 hours per week.

Material	Purpose
Elastic Rubber Bands	Necessary for bat-shooting mechanism
Tape	Secure sensor/motor cables to ports
6 Ping Pong Balls	Projectiles

Week Number	1	2	3	4	5	6	7	8	Total
Josh Donath	5.0	9.0	8.0	7.0	7.0	8.0	6.0	6.0	48.0
Victor Repkow	4.5	9.0	2.0	7.0	4.0	14.0	5.0	5.0	48.5
Mathieu Pigeon	3.0	9.0	0.0	9.0	12.0	10.0	5.0	5.0	53.0
Bobak Baghi	3.0	8.0	8.0	8.0	7.0	16.0	5.0	4.0	51.0
Clara Dionet	3.0	8.0	3.0	5.5	9.5	7.5	5.5	5.0	44.0
Musa Shakib Khan	3.0	12.0	2.0	7.0	5.0	3.0	8.0	6.0	44.0
Total Time									288.5