Mindstorm Documentation

Release 0.1

Gregor von Laszewski

September 02, 2015

CONTENTS

ONE

ABOUT THIS WEB PAGE

This Web page contains some resources for the 2015 Lego Mindstorm FLL used by the Lakeview Lions.

The contents of this page is availabele in different formats. This includes

- HTML (this page)

- PDF

- epub

The contents of this page is maintained on github.com. Please send suggestions for improvements to <laszewski@gmail.com>.

FIRST LEGO LEAGUE

This years FLL is all about trash. There are a number of Web pages dedicated to this effort. This includes:

- First Lego League
- Team resources

Videos:

- Introduction Video
- Project Video
- Robot Challenge

2.1 Building Instructions:

The set of the chalange building instructions can be found on the FLL web page:

Source

It includes the following:

- Element Overview
- Model Overview
- All files in zip format
    - Bag 1
    - Bag 2
    - Bag 3
    - Bag 4
    - Bag 5
    - Bag 6
    - Bag 7
    - Bag 8
    - Bag 9
    - Bag 10

TRASH CHALLANGE LINKS

- IU Sustainebility programs

- EPA summary on waste generation in the U.S.

ROBOT

There are many cool designs for robots that we need to explore to master the FLL chalanges. One such Robot that seems to be very useful s a robot called Sirius. The BUilding instructions are avialable as

- HTML Instructions
- `LXF File`
- Video

The person that designed this robot has a Youtube Channel:

- https://www.youtube.com/channel/UCuXq-jiU0ANeBcF_Tvq1D7g

Attachments are also Available

- Doggear (Video)
- Wormgear (Video)

Possible useful ideas to build attachments include:

- Forklift Attachment 1 (Video)
- Forklift Attachment 2 (Video)

FIVE

SOFTWARE

5.1 LDD

A free lego design program allowing you to build and view 3D lego instructions on your MAC, PC, or ipad is available at

- http://ldd.lego.com/

We recommend that you download this program so you can view the LXF instructions conveniently. Once you start the program, you have different views, one of them is th ebuild view that allows you to see a step by step guide on how to build the robot. The computer instructions are superior in contrast to the paper printed instructions.

We found however that the instructions may be different on different coputers. We suggest that you find an easy to follow set. In order to provide one such set for a robot such as sirrius, we have included them in html format in a nother section of this document.

5.2 Free Lego Programming software

The free Lego software that runs the robot can be found on the lego site:

- http://www.lego.com/en-us/mindstorms/downloads/download-software

You can download the software for free on your PC or Mac and explore how the basics of programming work. This program provides an easy to use drag and drop visual programming grahical user interface.

The software does unfortunately not run on iPADs or tablets. However there seems to be an educational version that may be able to do that. However the version costs $99. Due to the small screen size of tablets this may not be that useful. If you have experience with it, please let us know.

5.3 Simulator (Under investigation)

There are two lego simulatoros available that allow the use of a simulator to learn how to program.

- TODO: put link here
- TODO: put link here

Either of them cost $50 and do not require the robot set. That means you can simulate a robot and its behavior on the computer. We do not have any experience in using them, so if you have experience with them send me a mail.

MINDSTORM SETS

There are two lego robot mindstorm sets available they are

- Home Eddition
- Educational Edition

The differences between the sets are explained here and here

In summary the education set includes:

- Rechargeable battery pack and charger (normally $60 and $25)
- Gyroscope ($30)
- Ultrasonic distance sensor ($30)

The education set does not include:

- Infrared Sensor ($30)
- Infrared Remote ($30)
- Software

Software may be additional $99 but you can also use the free software. We are not yet sure about the programability of the Gyro sensor.

We list some additional useful links:

- Lego Mindstorm educational store

EV3 search from lego site:

- http://search-en.lego.com/?q=ev3

NXT search from lego site:

- http://search-en.lego.com/?cc=US&lang=2057&q=nxt

ADDITIONAL INSTRUCTIONS

- BI 3006/48 - 31313 - Download size: 11.55 Mb

Extra Building Instructions

- http://www.lego.com/en-us/mindstorms/build-a-robot (see bellow, 5 instructions)

- http://www.lego.com/en-us/mindstorms/build-a-robot/rac3-truck (see bellow 12 instructions)

- EV3RSTORM - Download size: 51.81 Mb

- GRIPP3R - Download size: 51.35 Mb

- R3PTAR - Download size: 38.96 Mb

- TRACK3R - Download size: 29.49 Mb

- SPIK3R - Download size: 38.5 Mb

- BANNER PRINT3R - Download size: 15.03 Mb

- BOBB3E - Download size: 13.19 Mb

- DINOREX - Download size: 31.21 Mb

- EL3CTRIC GUITAR - Download size: 12.71 Mb

- EV3 GAME - Download size: 8.78 Mb

- EV3D4 - Download size: 17.09 Mb

- EV3MEG - Download size: 12.17 Mb

- KRAZ3 - Download size: 19.75 Mb

- MR B3AM - Download size: 14.76 Mb

- RAC3 TRUCK - Download size: 14.99 Mb

- ROBODOZ3R - Download size: 16.01 Mb

- WACK3M - Download size: 18.17 Mb