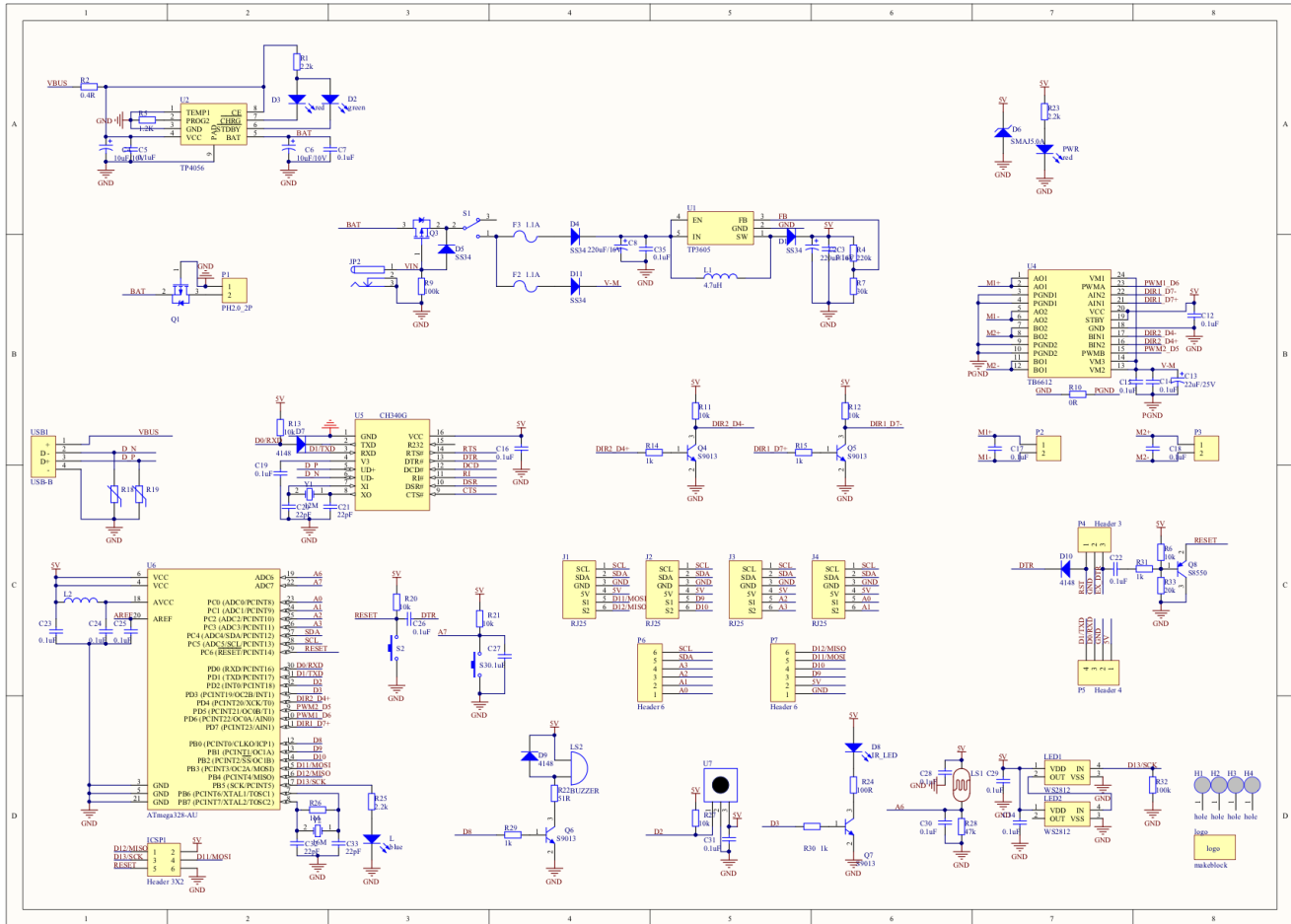


GIT Reference: <http://docs.makeblock.com/diy-platform/en/>

Schematic:



Pin Configuration:

Arduino Pin	mBot Port	Function
0		RXD
1		TXD
2		IR Receiver (RX)
3		IR Transmitter (TX)
4		Motor 2 Direction
5		Motor 2 PWM

6		Motor 1 PWM
7		Motor 1 Direction
8		Buzzer
9		Connector 2 - Yellow
10		Connector 2 - Blue
11		Connector 1 - Yellow
12		Connector 1 - Blue
13		LED Indicator & RGB LEDs
A0		Connector 4 - Yellow
A1		Connector 4 - Blue
A2		Connector 3 - Yellow
A3		Connector 3 - Blue
A4		Connector 3 & 4 SDA - Black
A5		Connector 3 & 4 SCL - Black
A6		Light Sensor

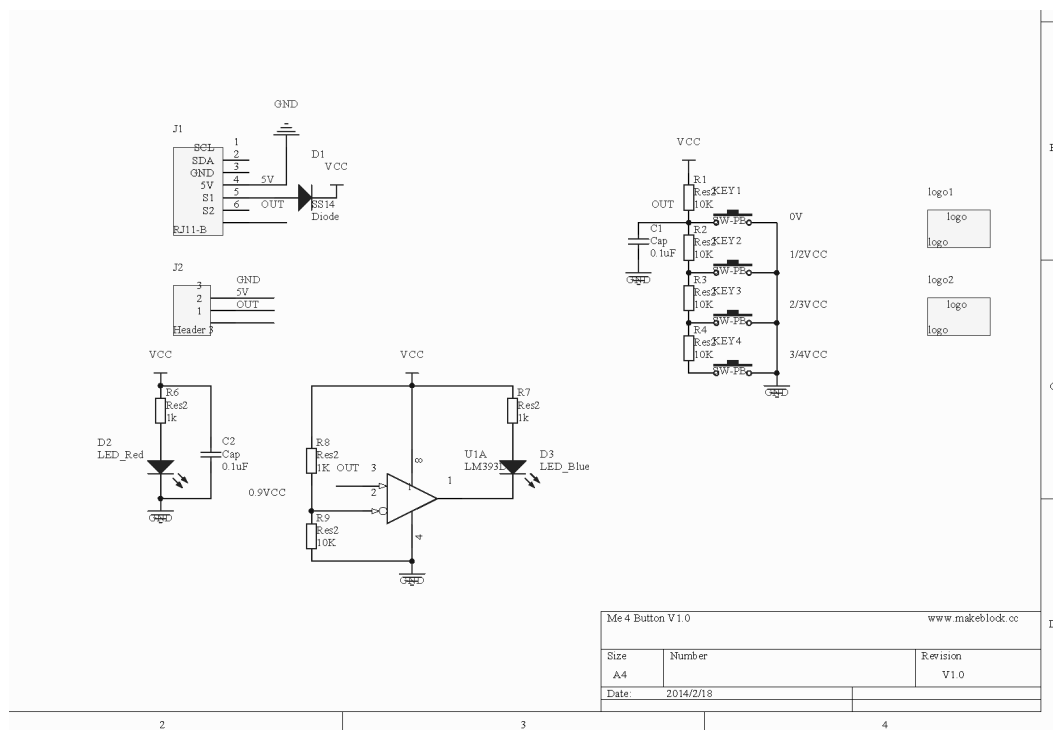
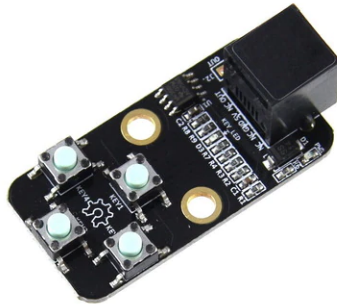
Installing the Makeblock sensor and module library:

1. Download the library from
<https://codeload.github.com/Makeblock-official/Makeblock-Libraries/zip/master>
2. Open the Arduino IDE and click on Sketch → Include Library → Add .Zip Library...
3. Select the library you downloaded and click Open
4. Examples for each sensor and module can be found under File → Examples → MakeBlockDrive

Sensors & Modules:

1. 4-button module
2. Ultrasonic distance sensor
3. Line following sensor
4. IR TX/RX and remote
5. RGB LEDs
6. LED matrix
7. Servo module
8. Buzzer
9. Bluetooth communication

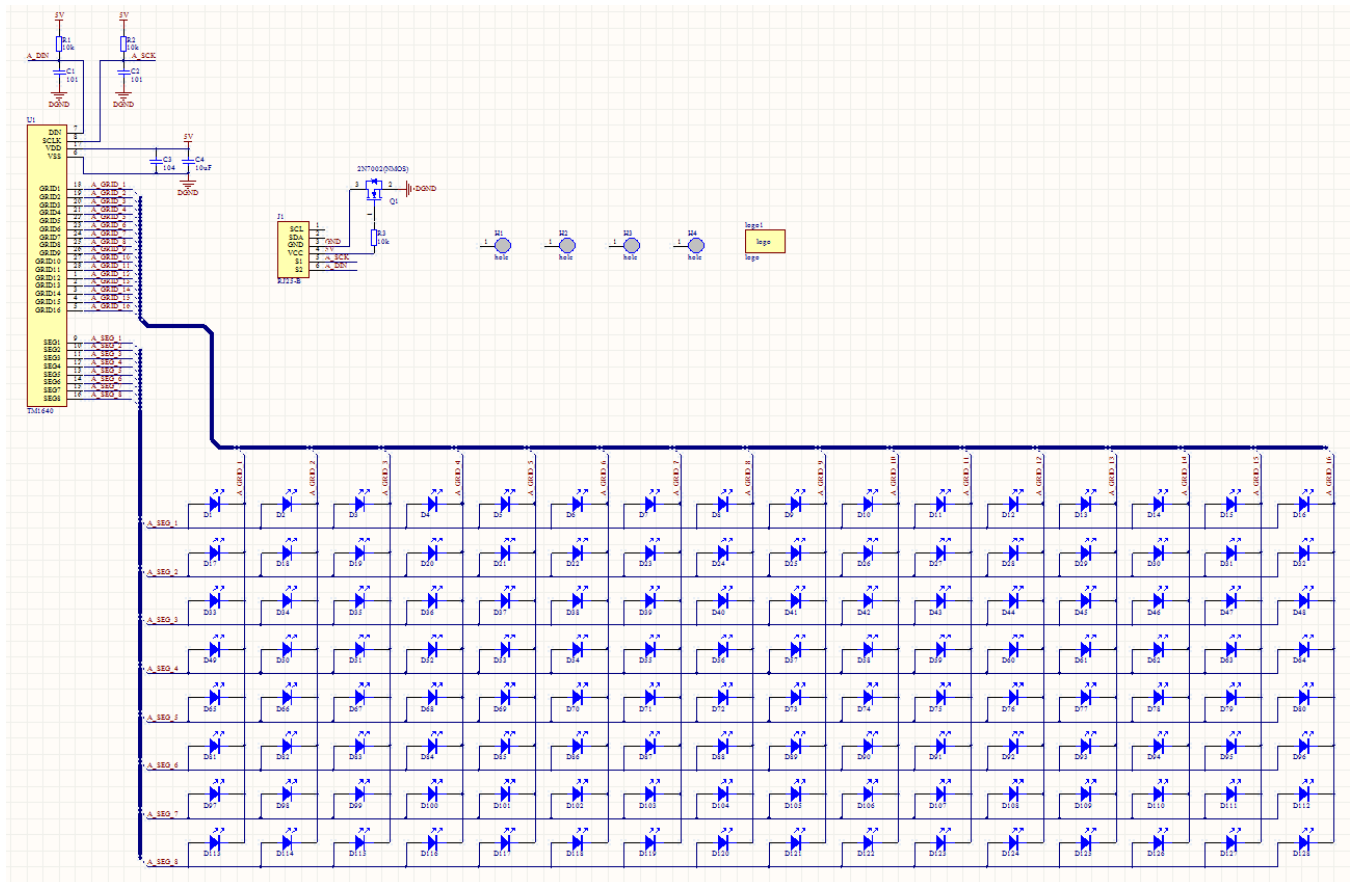
4-Button module:



Pinout:

Sensor Pin	Color
Signal	Blue (Only on connector 3 & 4)

LED matrix:



Notes:

TM1640 based (use <https://github.com/maxint-rd/TM16xx>)

Adafruit GFX Library

by **Adafruit**

Adafruit GFX graphics core library, this is the 'core' class that all our other graphics libraries derive from. Install this library in addition to the display library for your hardware.

[More info](#)

Version 1.10.4



Install

Dependencies for library Adafruit GFX Library:1.10.4

The library **Adafruit GFX Library:1.10.4** needs some other library dependencies currently not installed:

- **Adafruit BusIO**

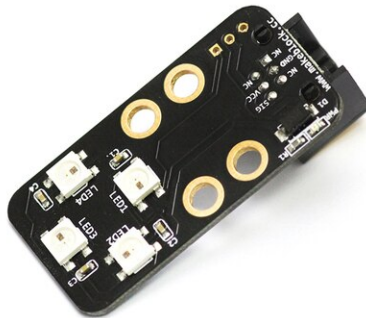
Would you like to install also all the missing dependencies?

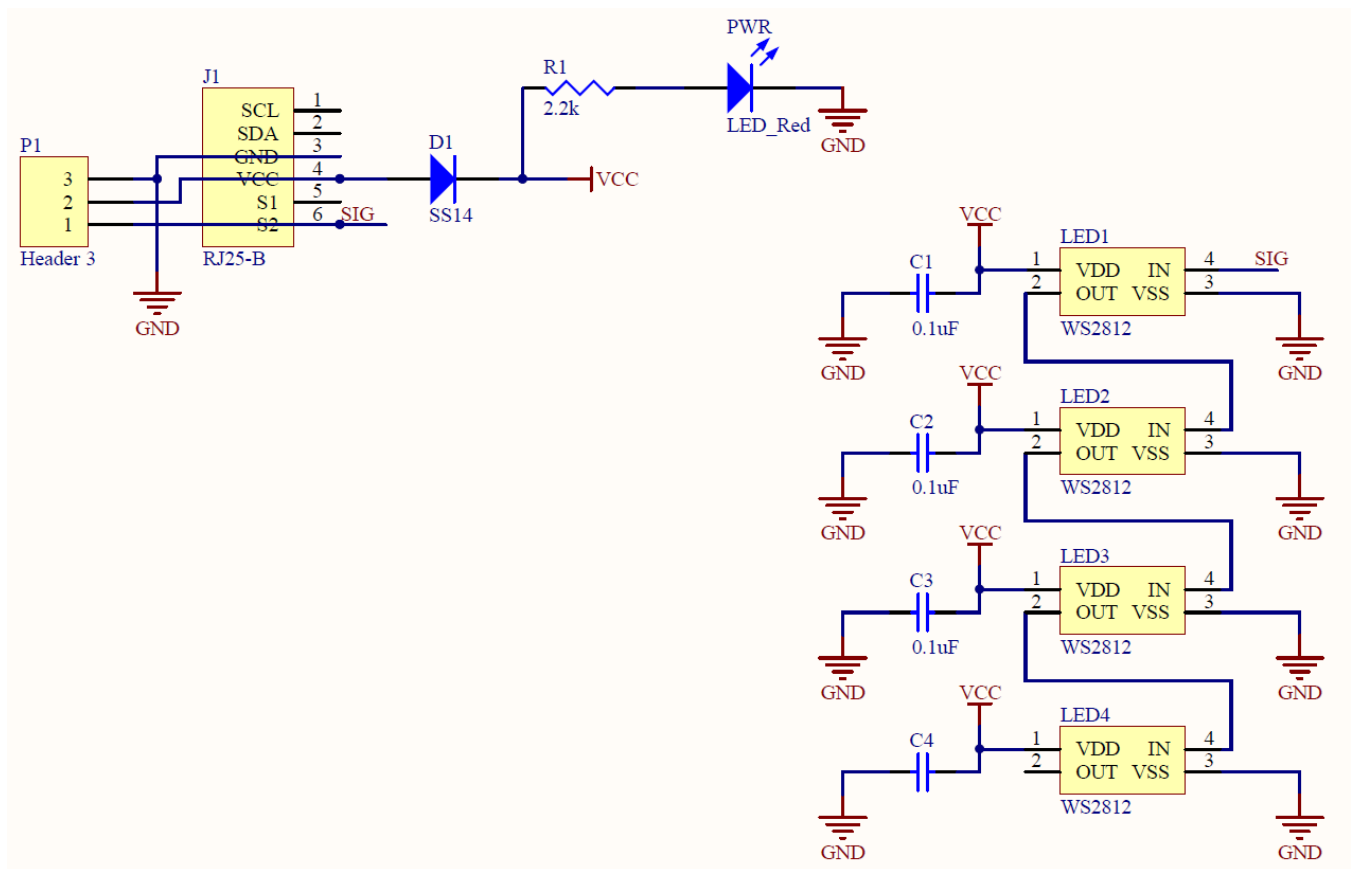
Install all

Install 'Adafruit GFX Library' only

Cancel

RGB LED:





Pinout:

Sensor Pin	Color
Signal	Blue

IR Communication:

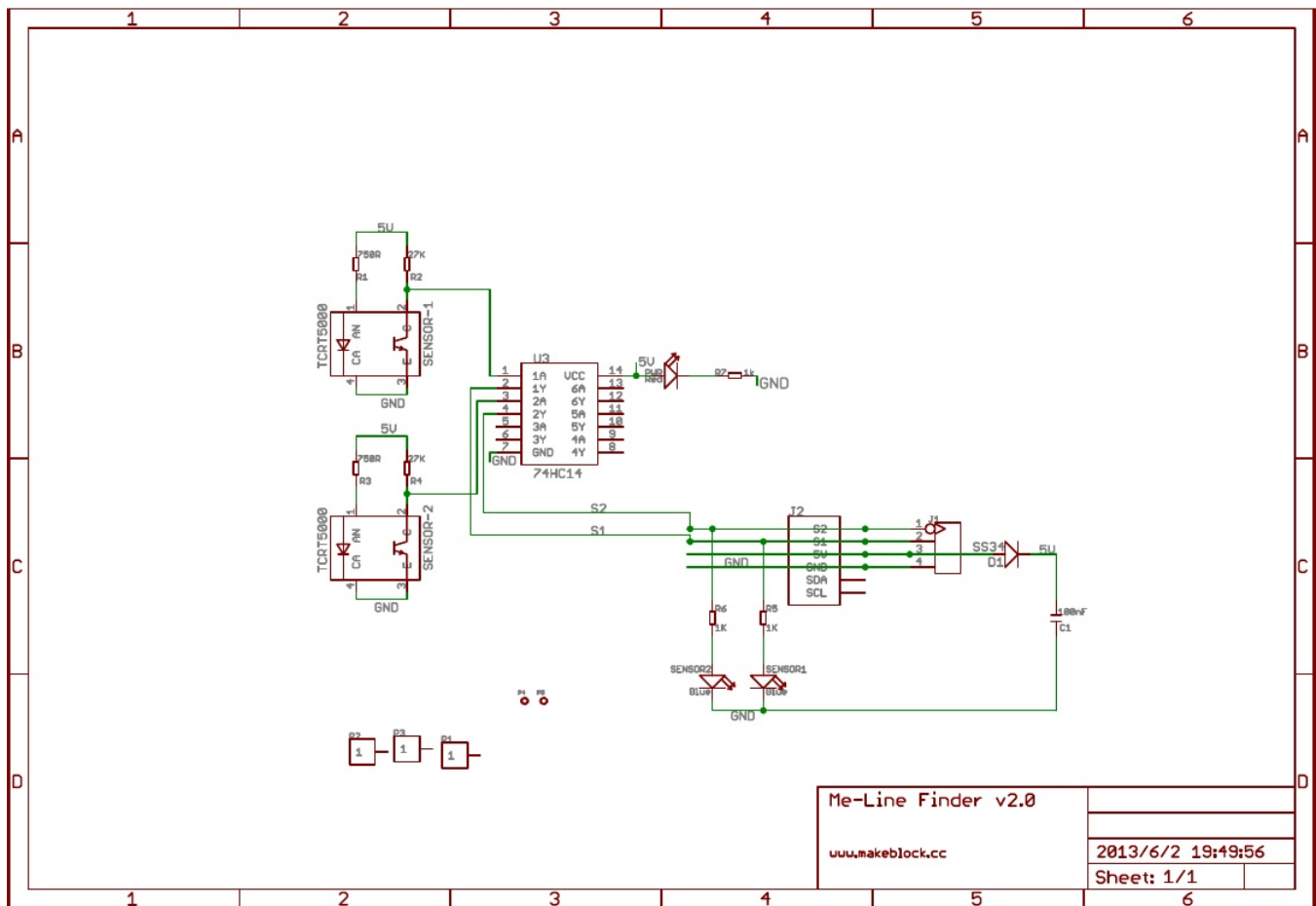
Button	Command
A	0x45
B	0x46
C	0x47
D	0x44
E	0x43
F	0x0D
Up	0x40

Down	0x19
Left	0x07
Right	0x09
Center	0x15
0	0x16
1	0x0C
2	0x18
3	0x5E
4	0x08
5	0x1C
6	0x5A
7	0x42
8	0x52
9	0x4a

Ultrasonic Sensor:



Line Sensor:



Pinout:

Sensor Pin	Color
Left	Yellow
Right	Blue

Buzzer:

	C	C#	D	Eb	E	F	F#	G	G#	A	Bb	B
0	16.35	17.32	18.35	19.45	20.60	21.83	23.12	24.50	25.96	27.50	29.14	30.87
1	32.70	34.65	36.71	38.89	41.20	43.65	46.25	49.00	51.91	55.00	58.27	61.74
2	65.41	69.30	73.42	77.78	82.41	87.31	92.50	98.00	103.8	110.0	116.5	123.5
3	130.8	138.6	146.8	155.6	164.8	174.6	185.0	196.0	207.7	220.0	233.1	246.9
4	261.6	277.2	293.7	311.1	329.6	349.2	370.0	392.0	415.3	440.0	466.2	493.9
5	523.3	554.4	587.3	622.3	659.3	698.5	740.0	784.0	830.6	880.0	932.3	987.8
6	1047	1109	1175	1245	1319	1397	1480	1568	1661	1760	1865	1976
7	2093	2217	2349	2489	2637	2794	2960	3136	3322	3520	3729	3951
8	4186	4435	4699	4978	5274	5588	5920	6272	6645	7040	7459	7902

Asdf

Bluetooth communication:



Press and hold the button until it begins flashing, then turn on the mBot. They should automatically pair and the mBot can now be programmed & controlled wirelessly.

Audio player:



<http://docs.makeblock.com/diy-platform/en/electronic-modules/sensors/me-audio-player.html>

Smart camera:



Sensor & Module labs:

1. 4-button module
 - a. Review of input control. Have the students demonstrate up/down/left/right response (15-20 min)
2. Ultrasonic distance sensor
 - a. Manually write the distance ranging code, then use the built-in library (15-20 min)
3. Line following sensor
 - a. Manually write the line-following code for bang-bang style response and edge detection (30-45 min)
4. IR TX/RX and remote
 - a. Manually write the IR receive code using the remote control (1.5 hrs)
5. RGB LEDs

- a. Use the built-in library to control each RGB led and cycle through color and brightness options (15-20 min)
6. LED matrix
 - a. Use the built-in library to display image or text (45 min)
7. Servo module
 - a. Manually write servo control code based on uS timing, then use built-in servo library for control (45 min)
8. Buzzer
 - a. Manually write PWM code to determine frequency range. Make a hearing test program with visual response. (30-45 min)
9. Bluetooth communication
 - a. Set up and demonstrate bi-directional communication over Bluetooth (15-20 min)
10. Audio player
 - a. Record and playback audio. Also, transfer files to module over USB. (20-30 min)
11. Camera

Design Project 1 (Flappy Bird):

- Use the button, LED matrix, and audio player modules to design a Flappy Bird style side-scrolling video game, complete with sound effects, scoring, and randomly generated terrain.
 - Unique module overview (audio board & LED matrix)
 - Overview of installing mBot library
 - Provide pre-written example to build from
 - Game should work as a battery-powered handheld, so it can be shared with each student in the class

Design Project 2 (Robot Race):

- Create a 2-wheeled robot and write code that can navigate around the racetrack at the highest speed.

Design Project 3 (Robot Pet):

- Create a virtual pet using the button, ultrasonic, audio player, line following, and IR modules. The pet should be able to detect your presence, display emotion, playback sound, and interact with other pets.

Final Design Project:

- Food delivery robot (either remote control or autonomous)
 - Designing the platform to hold the food item, something round (maybe small balls)
 - Obstacle avoidance
 - Path following
- Using ultrasonic sensor as an assistive device for avoiding obstacles and walking in the dark.
- Personal Home Assistant
 - Open-ended robot assistant project. The students use the available sensors and functions to produce a robot that “helps” out around the home. Examples include: food delivery, cleaning, TV remote control, fire alarm, personal assistant, morning wake-up alarm.
- Robot laser tag

