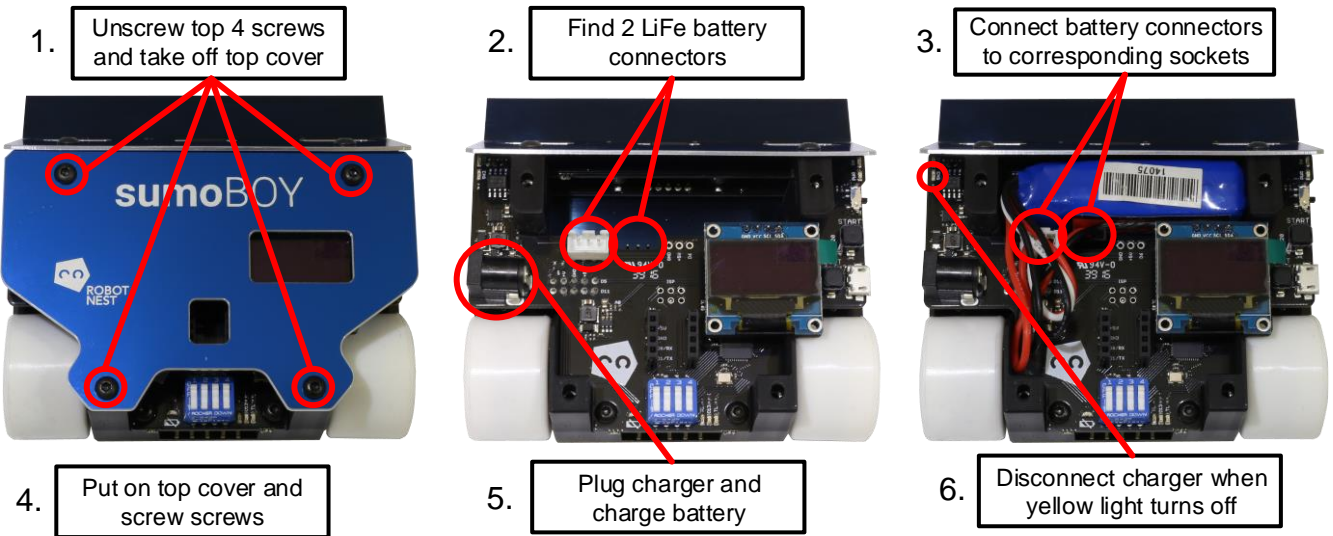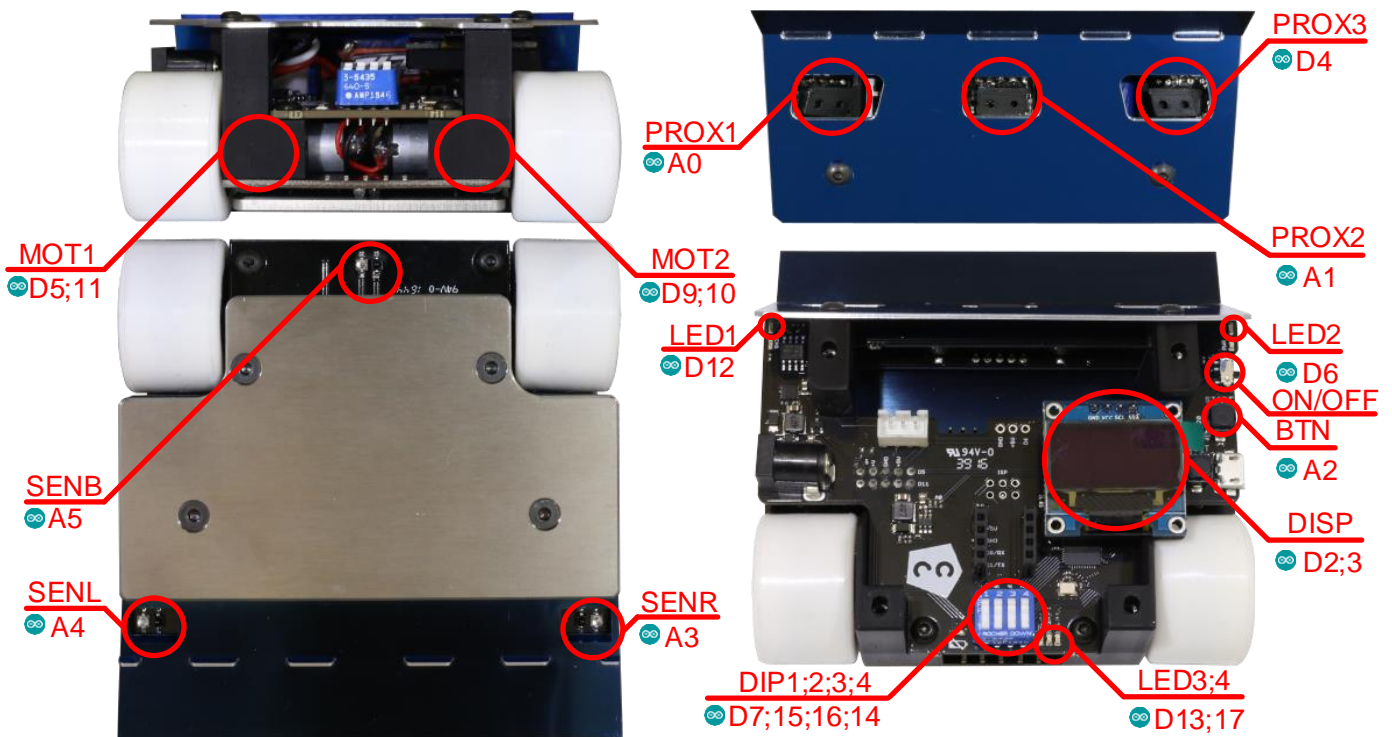# SumoBoy 2.0 Quick start guide

This guide briefly introduces to SumoBoy 2.0 functionality and programming, to get you faster to robot sumo fights. For more information check SumoBoy educational manual 2.0 and our web site www.robot-nest.com.

First time SumoBoy setup

1. Unscrew top 4 screws and take off top cover

2. Find 2 LiFe battery connectors

3. Connect battery connectors to corresponding sockets

4. Put on top cover and screw screws

5. Plug charger and charge battery

6. Disconnect charger when yellow light turns off

SumoBoy 2.0 build and Arduino connections

PROX3 — D4

PROX1 — A0

PROX2 — A1

MOT1 — D5;11

MOT2 — D9;10

LED1 — D12

LED2 — D6

ON/OFF

BTN — A2

DISP — D2;3

SENB — A5

SENL — A4

SENR — A3

DIP1;2;3;4 — D7;15;16;14

LED3;4 — D13;17

SumoBoy programming

1. Download and install Arduino programming environment from: https://www.arduino.cc/download_handler.php
2. Download and setup display libraries from: https://learn.adafruit.com/monochrome-oled-breakouts/arduino-library-and-examples
3. Connect SumoBoy to computer using USB cable.
4. In Arduino environment go to menu Tools/Board and choose Arduino type: " Arduino/Genuino Micro".
5. In Arduino environment go to menu Tools/Port and choose port with Arduino type: " Arduino/Genuino Micro".
6. Copy sample program from the next page to the Arduino environment.
7. Upload program, with arrow icon, and try your SumoBoy.

Good luck!

Simple Sumo-Boy program

```cpp
// Libraries for Display
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>
Adafruit_SSD1306 display(4);
void setup() {
  // Display setup
  display.begin(SSD1306_SWITCHCAPVCC,
0x3C, false);
  display.setTextSize(1);
  display.setTextColor(WHITE);
  //LED
  pinMode(12, OUTPUT); //Left LED
#define led1ON   digitalWrite(12,HIGH);
#define led1OFF  digitalWrite(12,LOW);
  pinMode(6, OUTPUT); //Right LED
#define led2ON   digitalWrite(6,HIGH);
#define led2OFF  digitalWrite(6,LOW);
  //Button
  pinMode(A2, INPUT);
  digitalWrite(A2, HIGH);
#define BTN !digitalRead(A2)
  //Line sensors
  pinMode(A4, INPUT);
#define SENL  analogRead(A4)<32
  pinMode(A3, INPUT);
#define SENR analogRead(A3)<31
  //Proximity sensors
  pinMode(A1, INPUT);
#define PROX2 !digitalRead(A1)
  //Motor pins
  //Left motor
  pinMode(5, OUTPUT);
  pinMode(11, OUTPUT);
  //Right Motor
  pinMode(9, OUTPUT);
  pinMode(10, OUTPUT);
}
//Motor functions
void Forward (int lSpeed, int rSpeed) {
  analogWrite(5, lSpeed);
  digitalWrite(11, LOW);
  analogWrite(9, rSpeed);
  digitalWrite(10, LOW);
}
void Backward (int lSpeed, int rSpeed) {
  analogWrite(11, lSpeed);
  digitalWrite(5, LOW);
  analogWrite(10, rSpeed);
  digitalWrite(9, LOW);
}

int senState = 0; //variable for sensors
```

```cpp
void loop() {
  Forward(0, 0); //Stop motors
  delay(100);
  if (BTN){//Turn on program with button
  while (BTN) { }
  while (!BTN){ //stop robot if button is
pushed again
      senState = 0; //reset variable to 0
    // Read sensors
      if (SENL) {
        led1ON;  senState = senState + 1;
      } else {
        led1OFF;
      }
      if (SENR) {
        led2ON;  senState = senState + 2;
      } else {
        led2OFF;
      }
      if (senState == 0) {
        if (PROX2) {
          senState = +4;
        }
      }
    //Display sensor results
      display.setCursor(0, 0);
      display.clearDisplay();
      display.print("SENL: ");
      display.println(SENL);
      display.print("SENR: ");
      display.println(SENR);
      display.print("SenState: ");
      display.println(senState);
      display.display();
      display.clearDisplay();
    //robot movement according to
senState
      switch (senState) {
        case 0://no white line
          Forward(40, 40);
          break;
        case 1: //white line on left
          Backward(100, 100);
          delay(300);
          Forward(100, 0);
          delay(200);
          break;
        case 2://white line on right
          Backward(100, 100);
          delay(300);
          Forward(0, 100);
          delay(200);
          break;
        case 3://white line in front
          Backward(150, 150);
          delay(300);
          break;
        case 4://Middle proximity sensor
          Forward(200, 200);
          break;
      }
    }
  while (BTN) {}
  }}
```