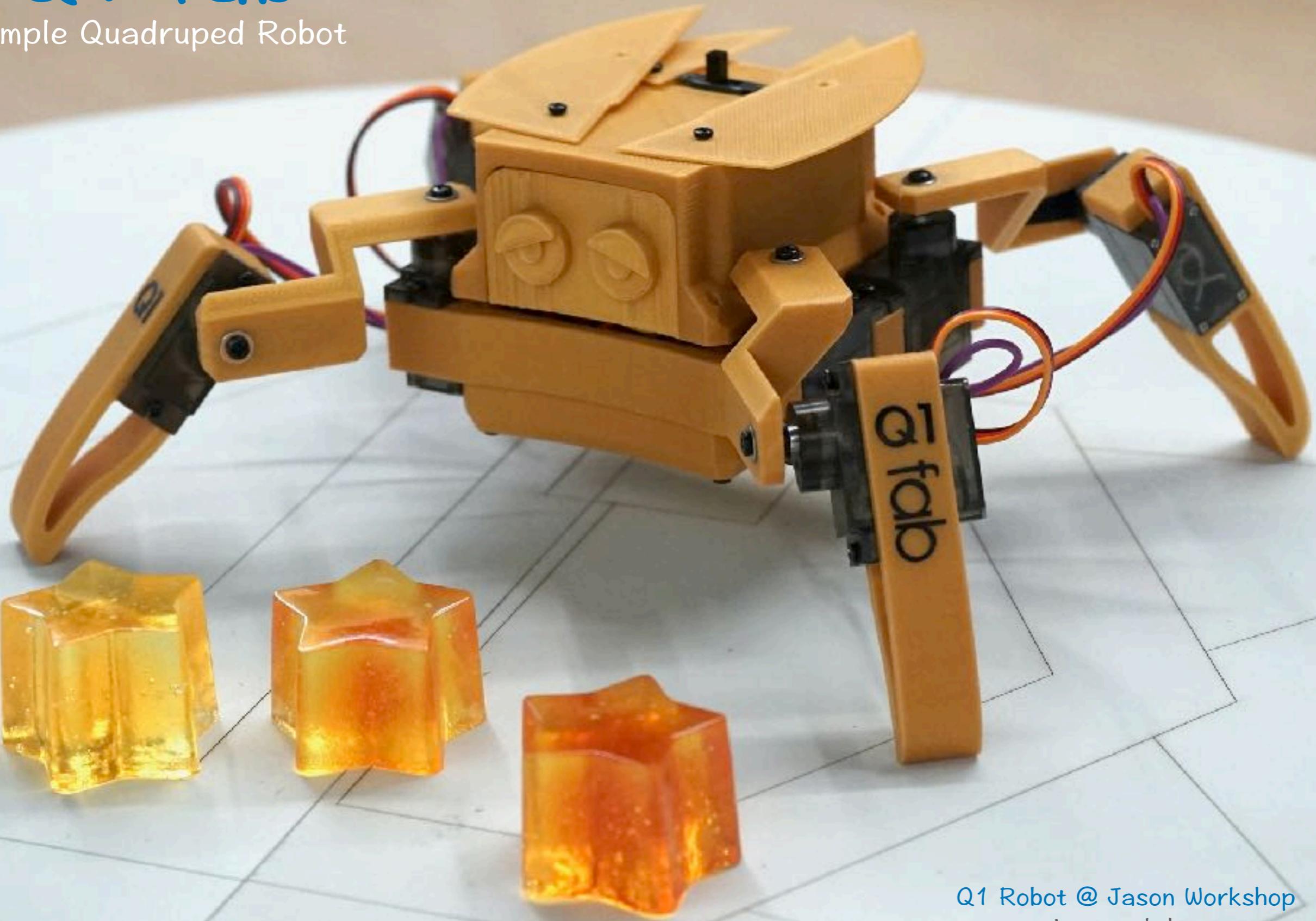


Q1 fab

Simple Quadruped Robot



Q1 Robot @ Jason Workshop
www.jasonworkshop.com

Licensing



Q1 fab is licensed under the Attribution-NonCommercial-ShareAlike 4.0 Unported (CC BY-NC-SA 4.0)

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<https://creativecommons.org/licenses/by-nc-sa/4.0/>

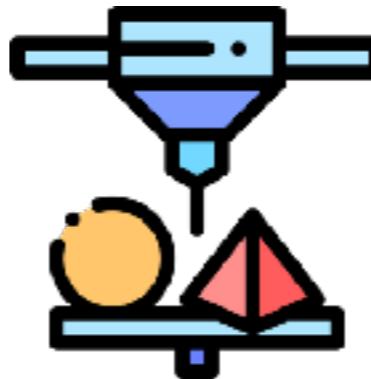
<https://creativecommons.org/licenses/by-nc-sa/4.0/tw/>

Q1 fab

Simple Quadruped Robot



Prepare Parts



3D Print



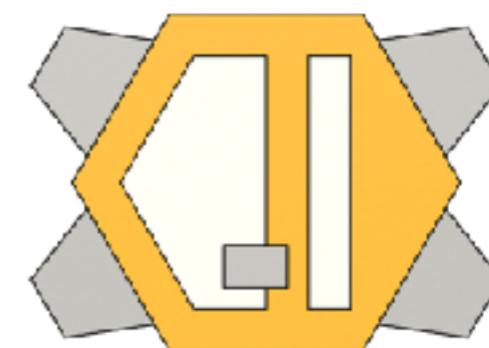
Software



Assemble



Play

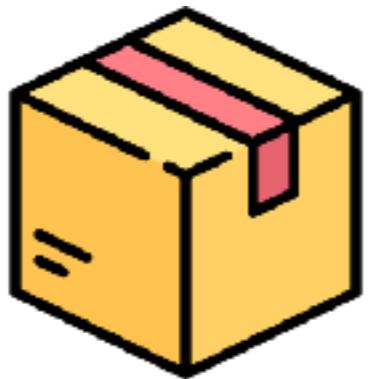


Sumo Game

Start Now!

Q1 fab

Simple Quadruped Robot



Prepare Parts



3D Print



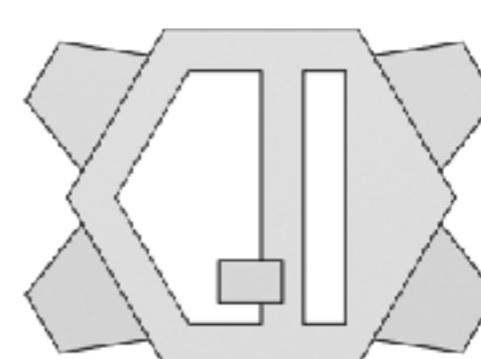
Software



Assemble



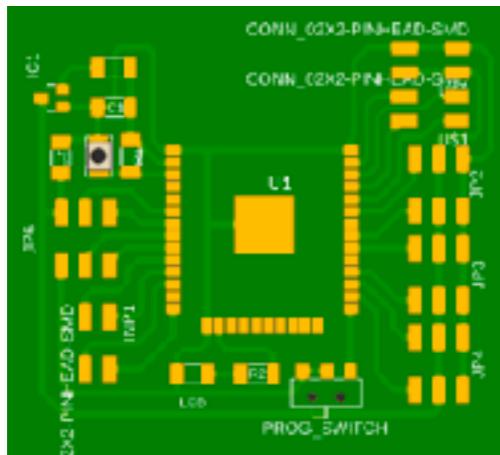
Play



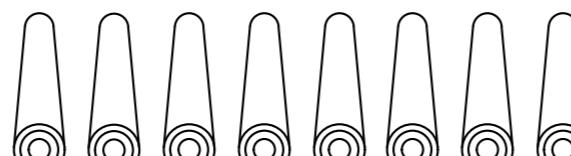
Sumo Game



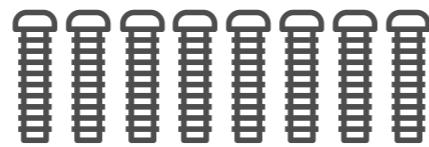
Prepare Parts \ Parts List



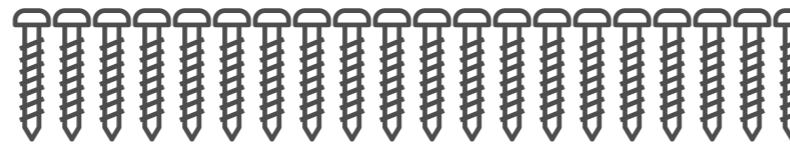
Q1 core ESP32
Control Board **x 1**



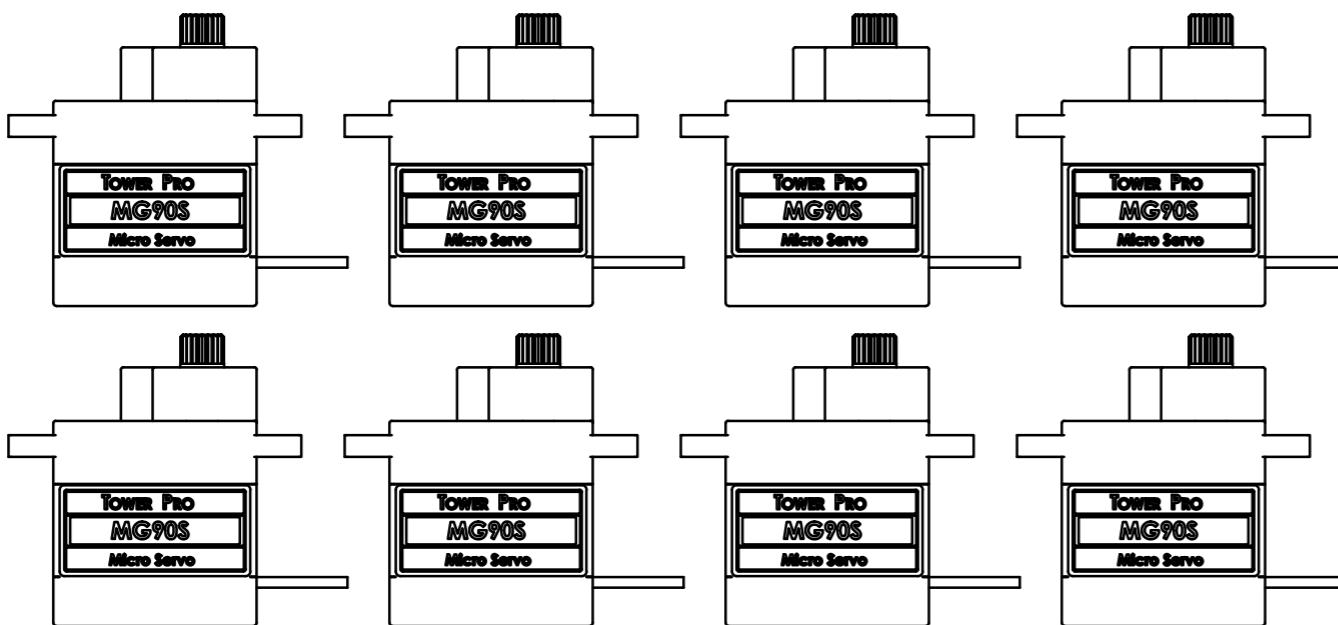
Servo Arm **x 8**



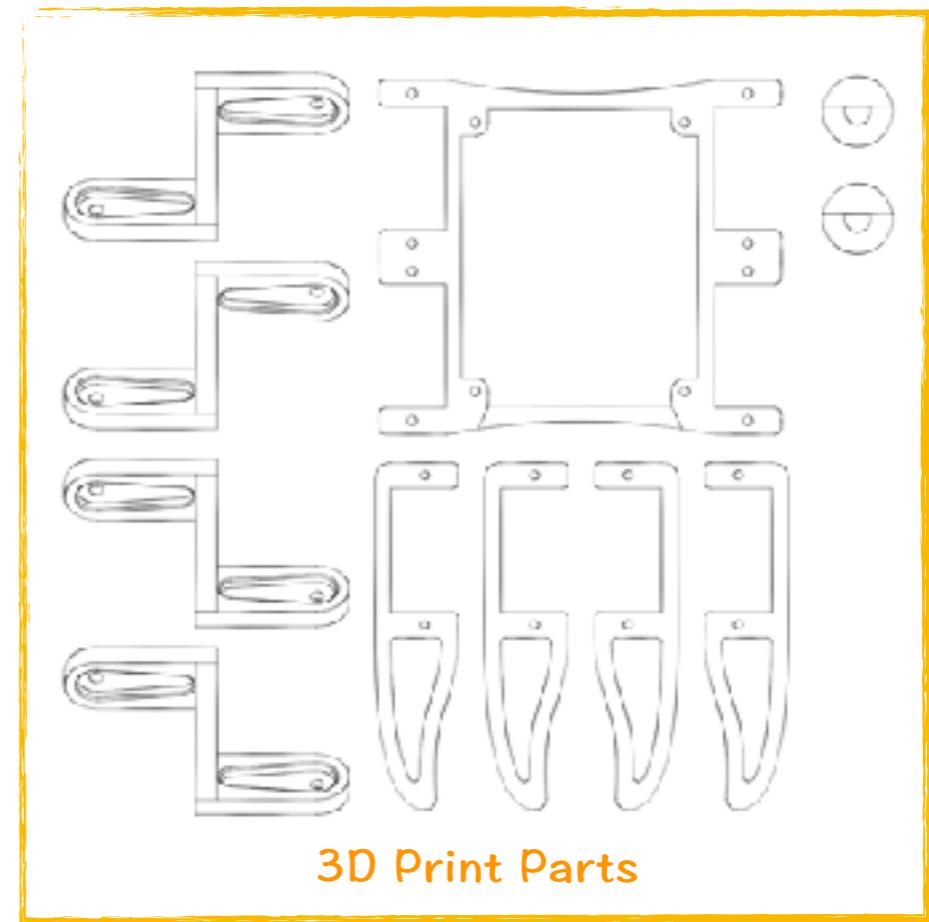
M2.5 x 8mm PM Screw **x 8**



M2 x 8mm PA Screw **x 20**



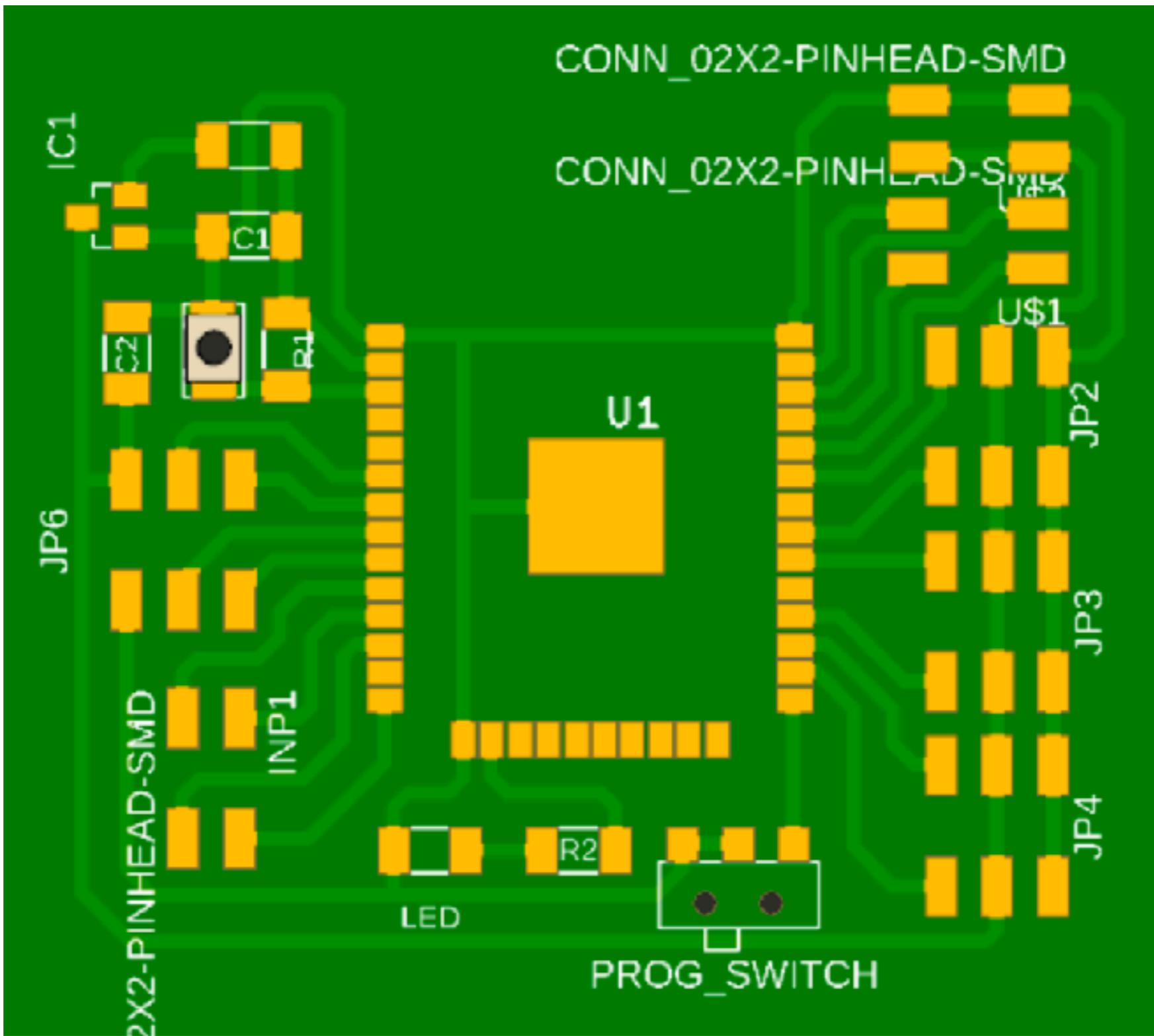
Tower Pro MG90d Servo **x 8**
(120 Degree)



3D Print Parts



Prepare Parts \ Q1 core ESP32 Control Board

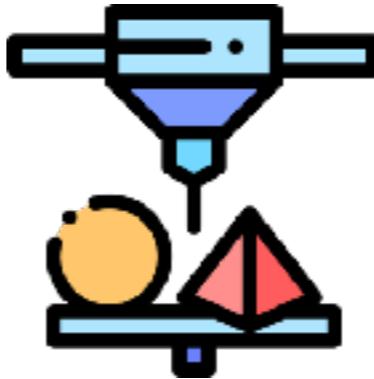


Q1 fab

Simple Quadruped Robot



Prepare Parts



3D Print



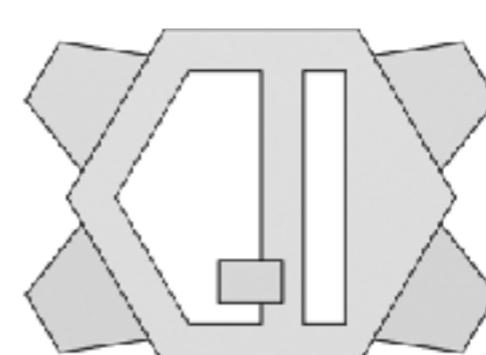
Software



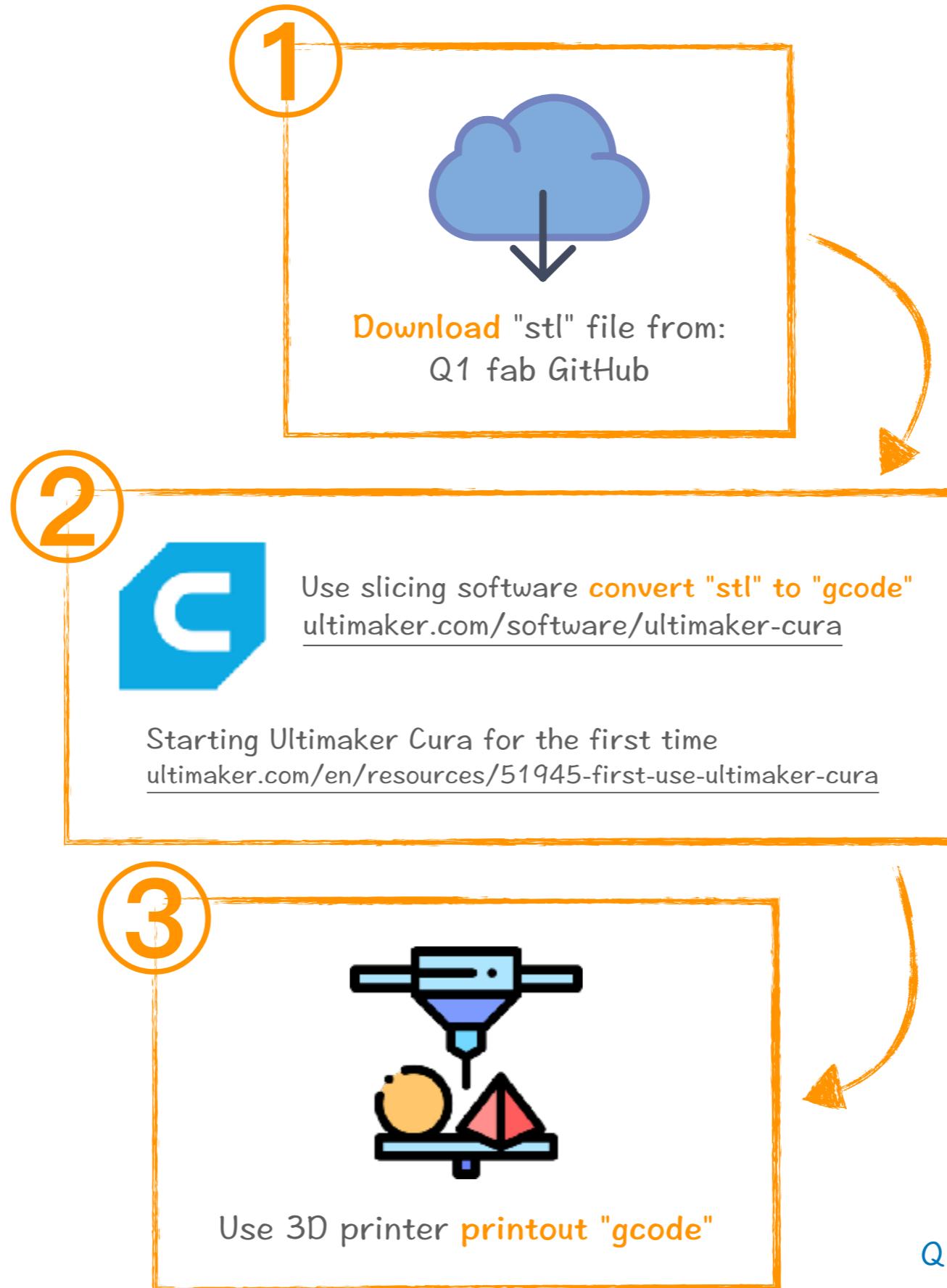
Assemble



Play

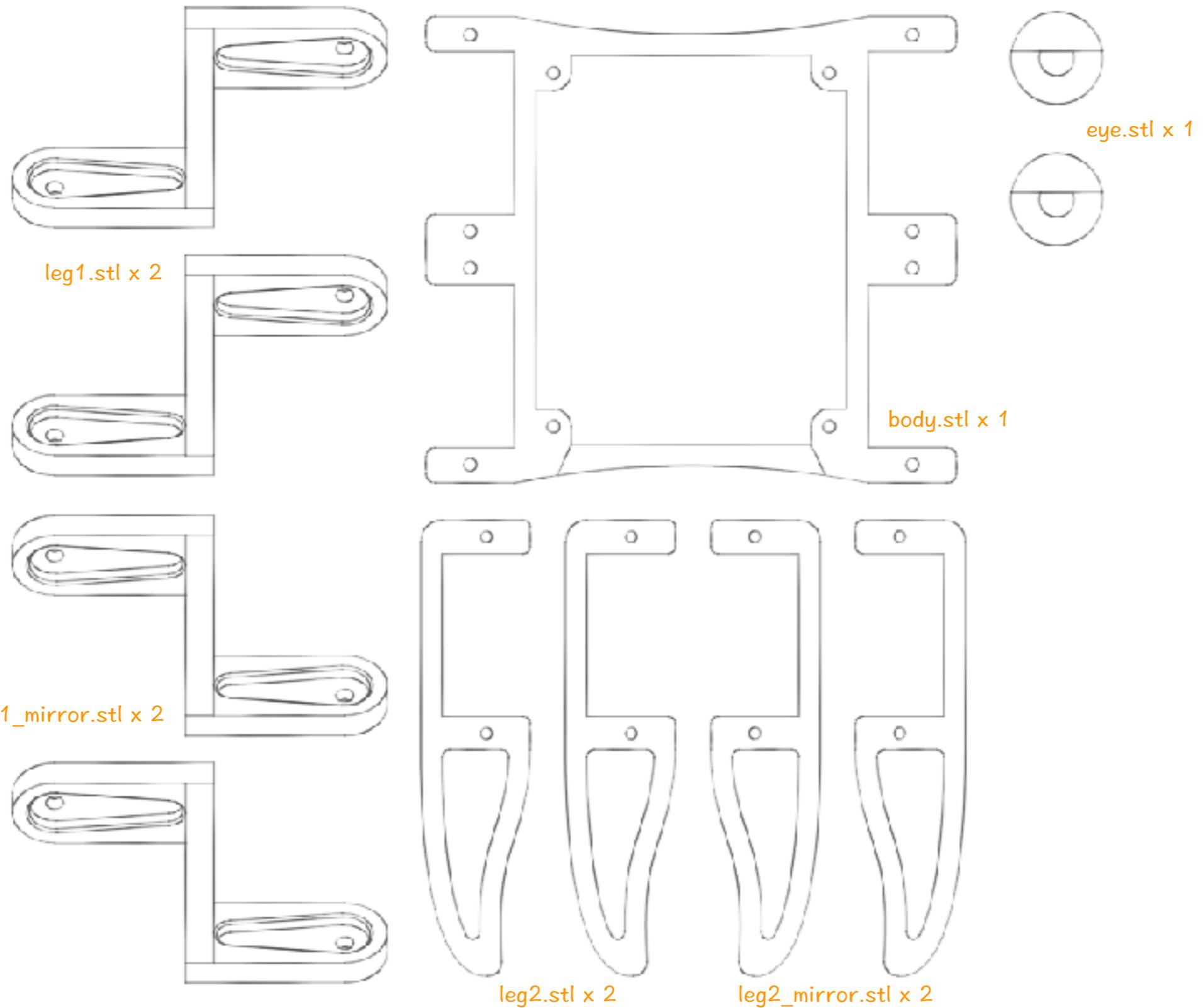


Sumo Game



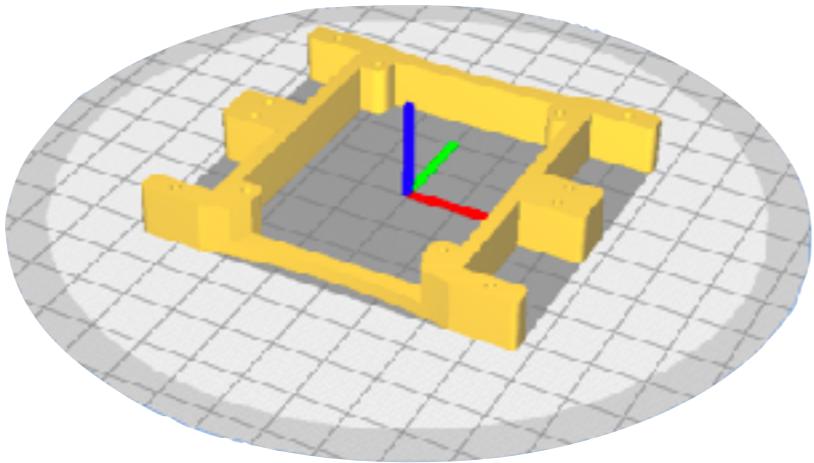


3D Print \ 3D Parts List



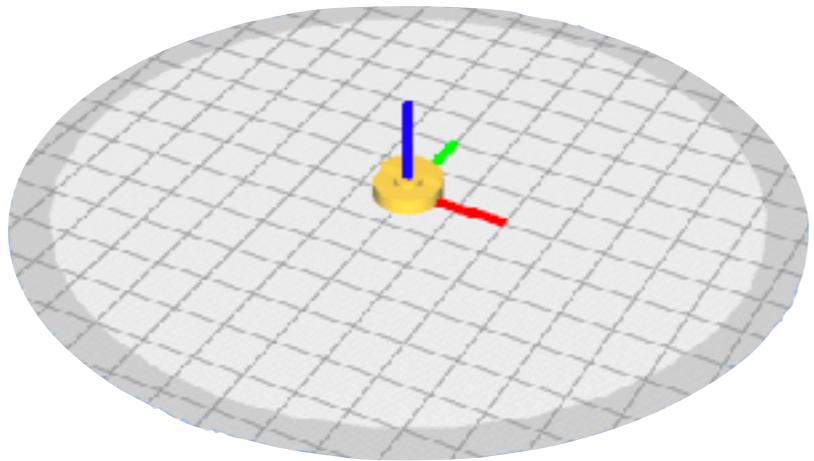


3D Print \ Print Suggestion (1/3)



body.stl x 1

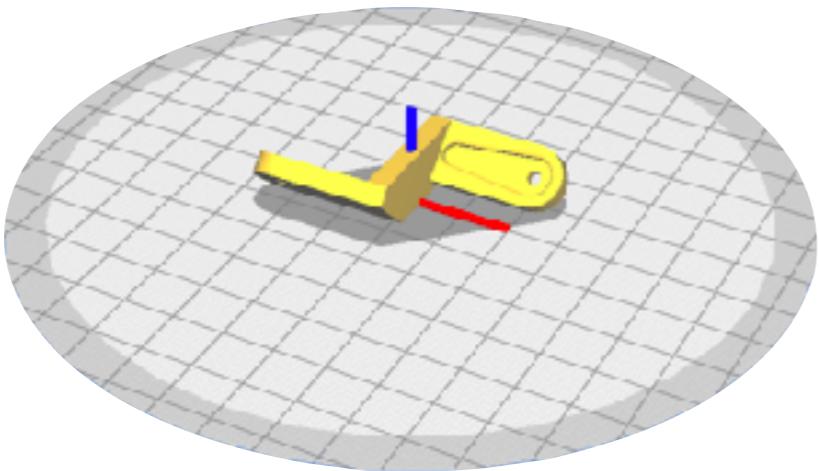
Nozzle size: 0.4mm
Layer Height: 0.2mm
Wall Thickness: 0.8mm
Infill Density: 20%
No Support



eye.stl x 1

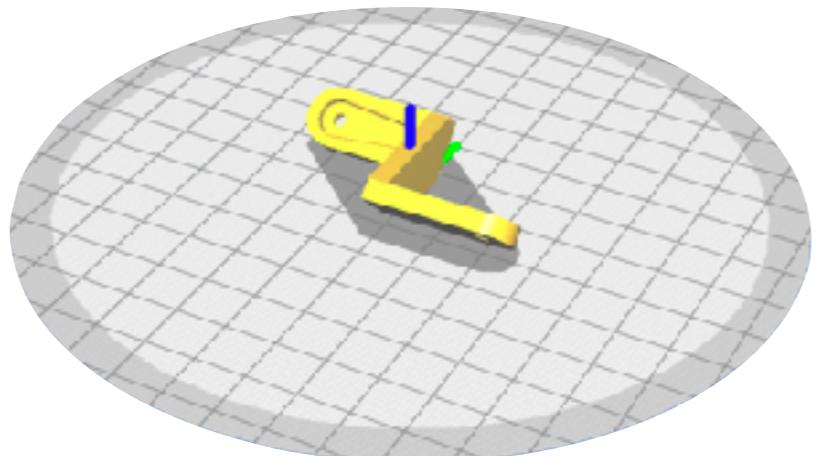


3D Print \ Print Suggestion (2/3)



leg1.stl x 2

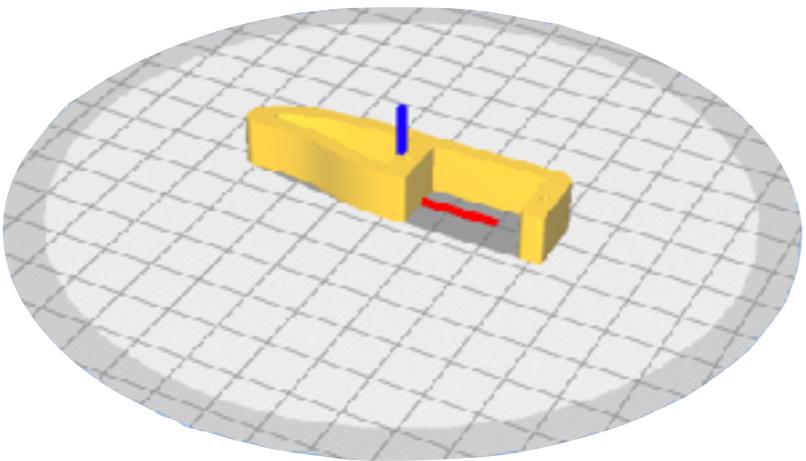
Nozzle size: 0.4mm
Layer Height: 0.2mm
Wall Thickness: 0.8 - 1.2mm
Infill Density: 20%
No Support



leg1_mirror.stl x 2

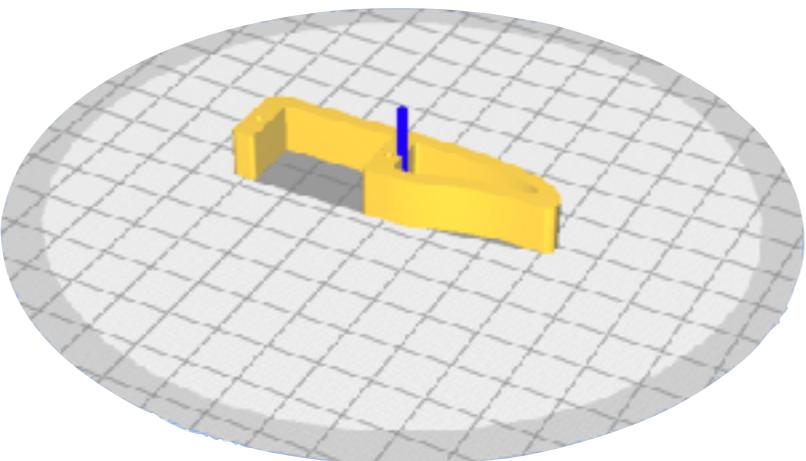


3D Print \ Print Suggestion (3/3)



leg2.stl x 2

Nozzle size: 0.4mm
Layer Height: 0.2mm
Wall Thickness: 0.8mm
Infill Density: 0 - 20%
No Support



leg2_mirror.stl x 2

Q1 fab

Simple Quadruped Robot



Prepare Parts



3D Print



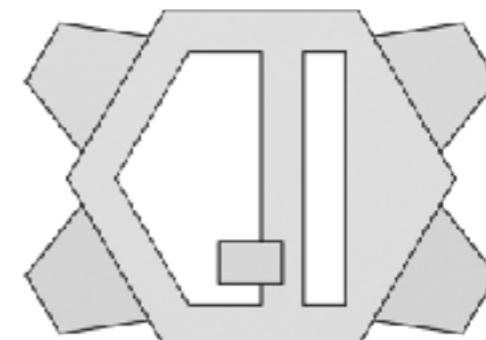
Software



Assemble



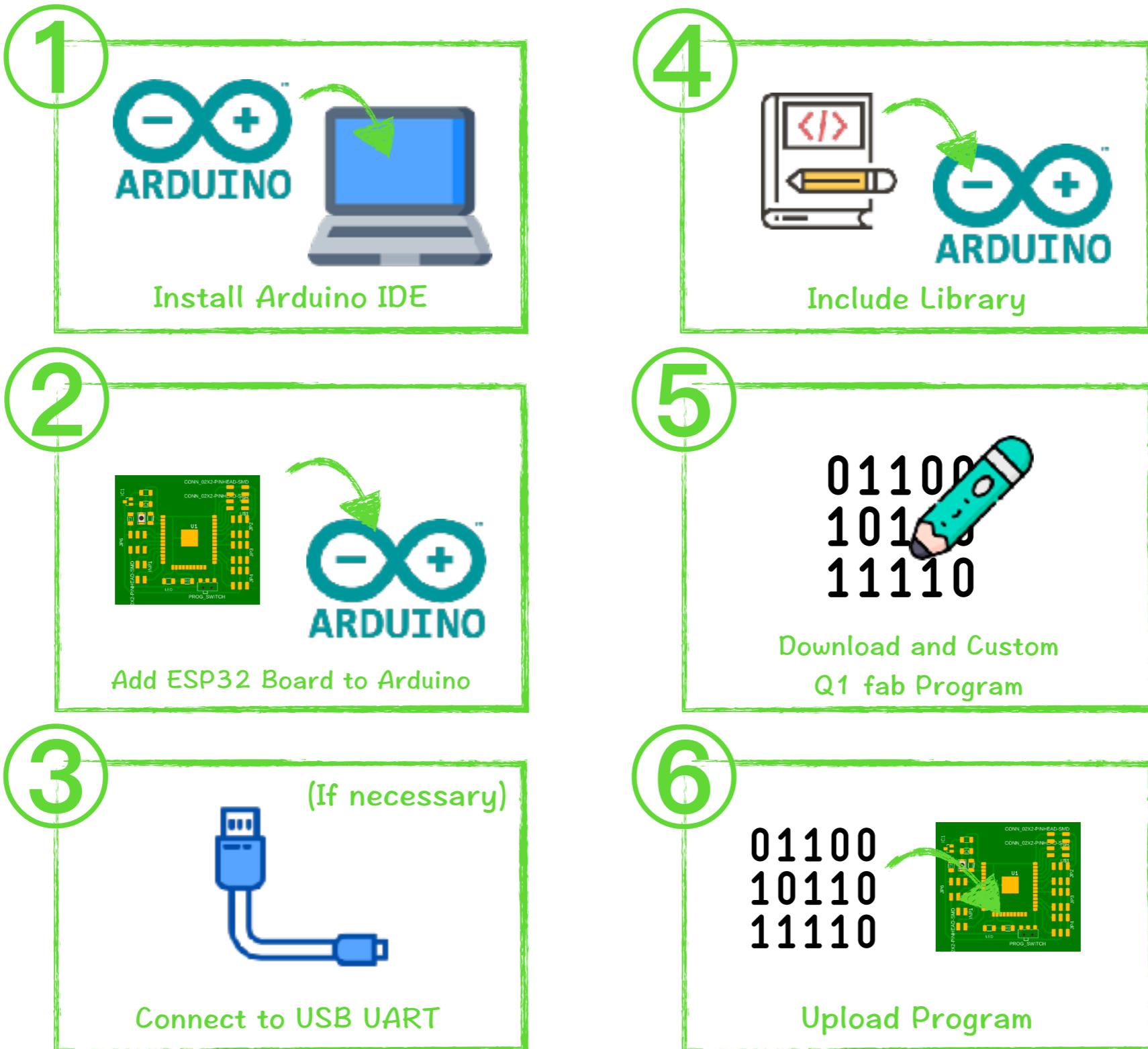
Play



Sumo Game



Software \ Workflow





Download and Install Arduino IDE to Computer
<https://www.arduino.cc/en/Main/Software>

Step-by-step Instructions for Install the Arduino IDE
<https://www.arduino.cc/en/Guide/HomePage>

ARDUINO 1.8.10
The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software.
This software can be used with any Arduino board.
Refer to the [Getting Started](#) page for installation instructions.

Windows Installer, for Windows XP and up
Windows ZIP file for non admin install

Windows app Requires Win 8.1 or 10
[Get](#)

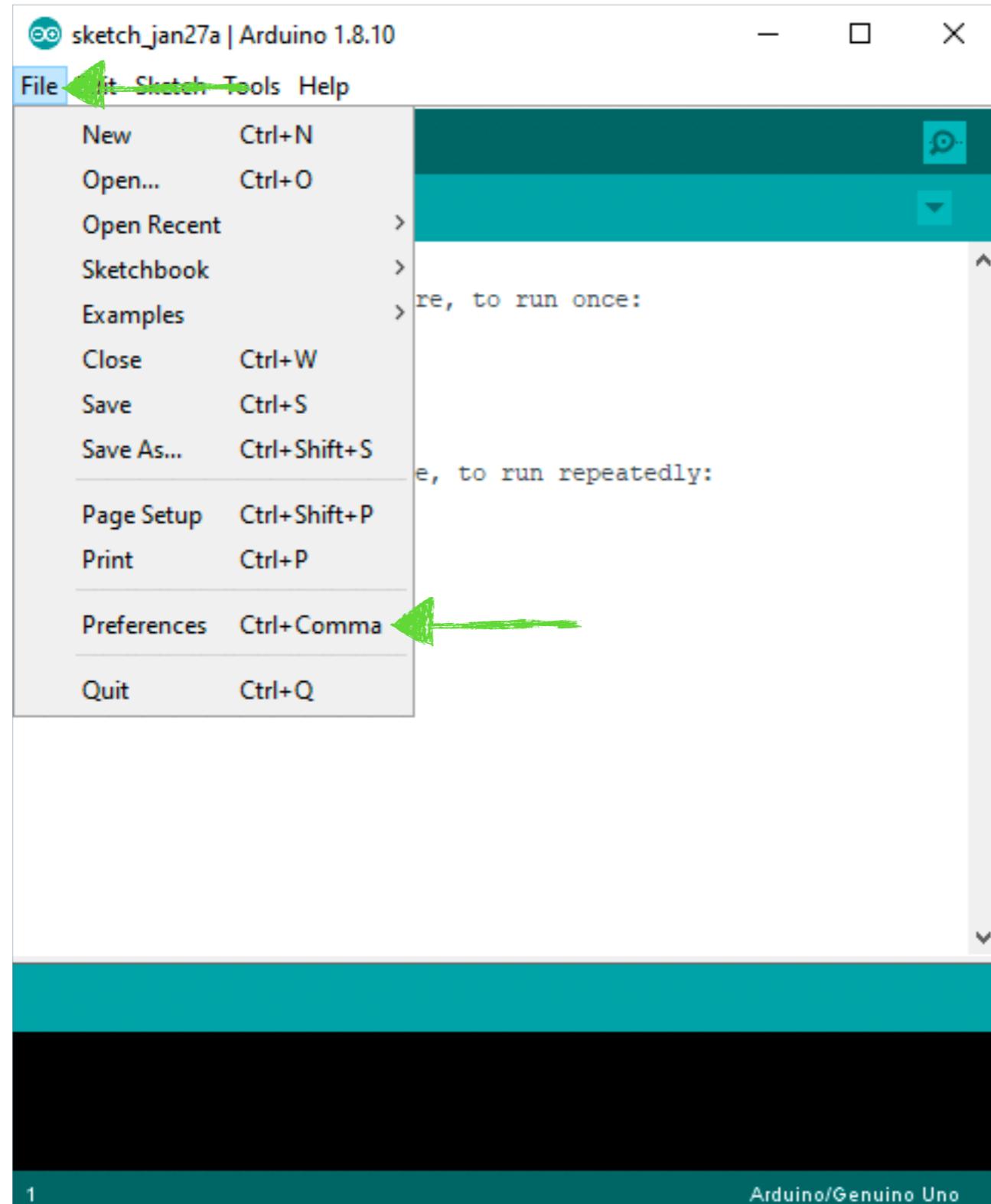
Mac OS X 10.8 Mountain Lion or newer

LINUX 32 bits
Linux 64 bits
Linux ARM 32 bits
Linux ARM 64 bits

[Release Notes](#)
[Source Code](#)
[Checksums \(sha512\)](#)



Software \ Add ESP32 Board to Arduino (1/7)





Software \ Add ESP32 Board to Arduino (2/7)

Preferences X

Settings Network

Sketchbook location: Browse

Editor language: (requires restart of Arduino)

Editor font size:

Interface scale: Automatic % (requires restart of Arduino)

Theme: (requires restart of Arduino)

Show verbose output during: compilation upload

Compiler warnings:

Display line numbers Enable Code Folding
 Verify code after upload Use external editor
 Check for updates on startup Save when verifying or uploading
 Use accessibility features

Additional Boards Manager URLs: Import

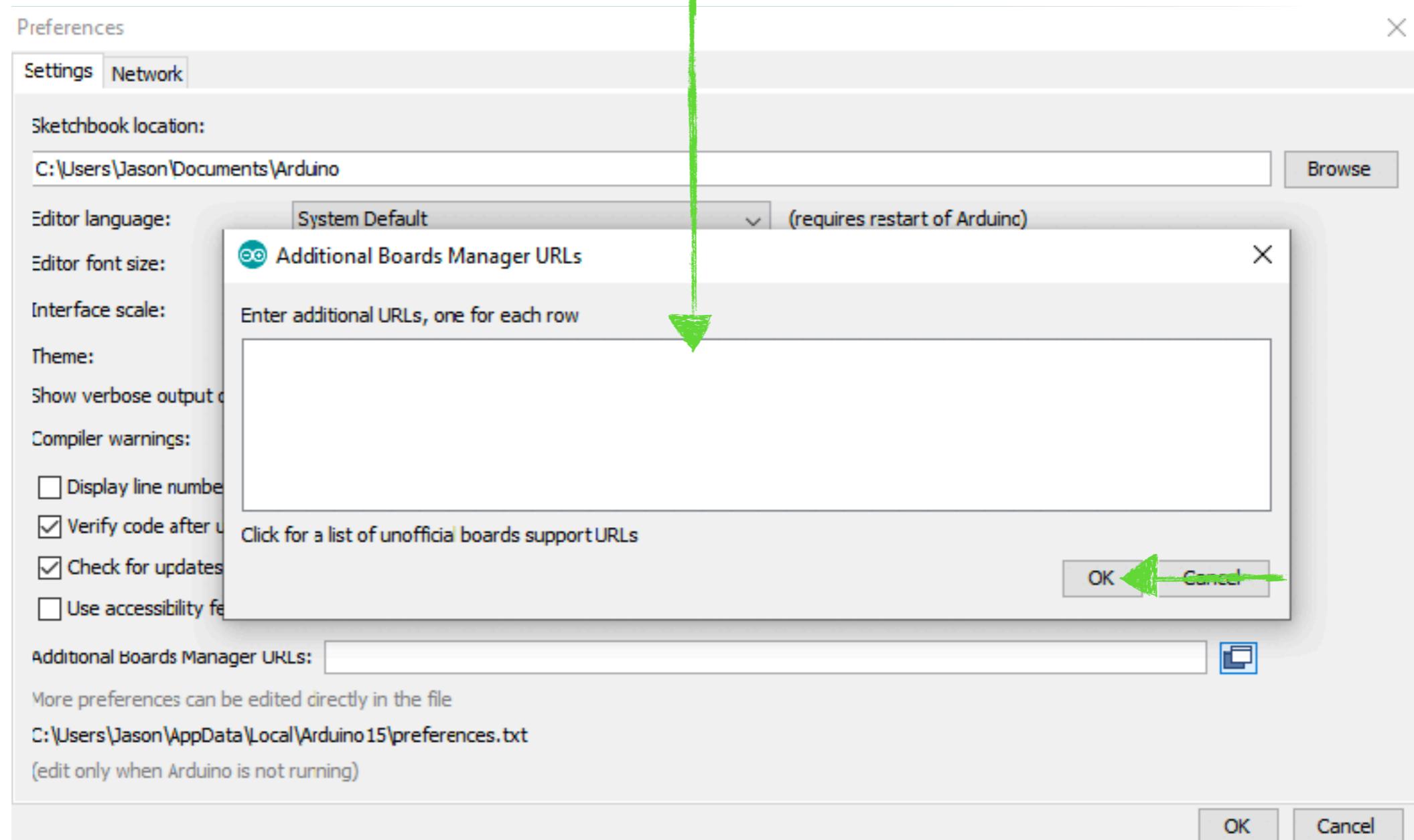
More preferences can be edited directly in the file
C:\Users\Jason\AppData\Local\Arduino15\preferences.txt
(edit only when Arduino is not running)

OK Cancel



Software \ Add ESP32 Board to Arduino (3/7)

https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json





Software \ Add ESP32 Board to Arduino (4/7)

Preferences X

Settings Network

Sketchbook location: C:\Users\Jason\Documents\Arduino Browse

Editor language: System Default (requires restart of Arduino)

Editor font size: 12

Interface scale: Automatic 100% (requires restart of Arduino)

Theme: Default theme (requires restart of Arduino)

Show verbose output during: compilation upload

Compiler warnings: None Display line numbers Enable Code Folding
 Verify code after upload Use external editor
 Check for updates on startup Save when verifying or uploading
 Use accessibility features

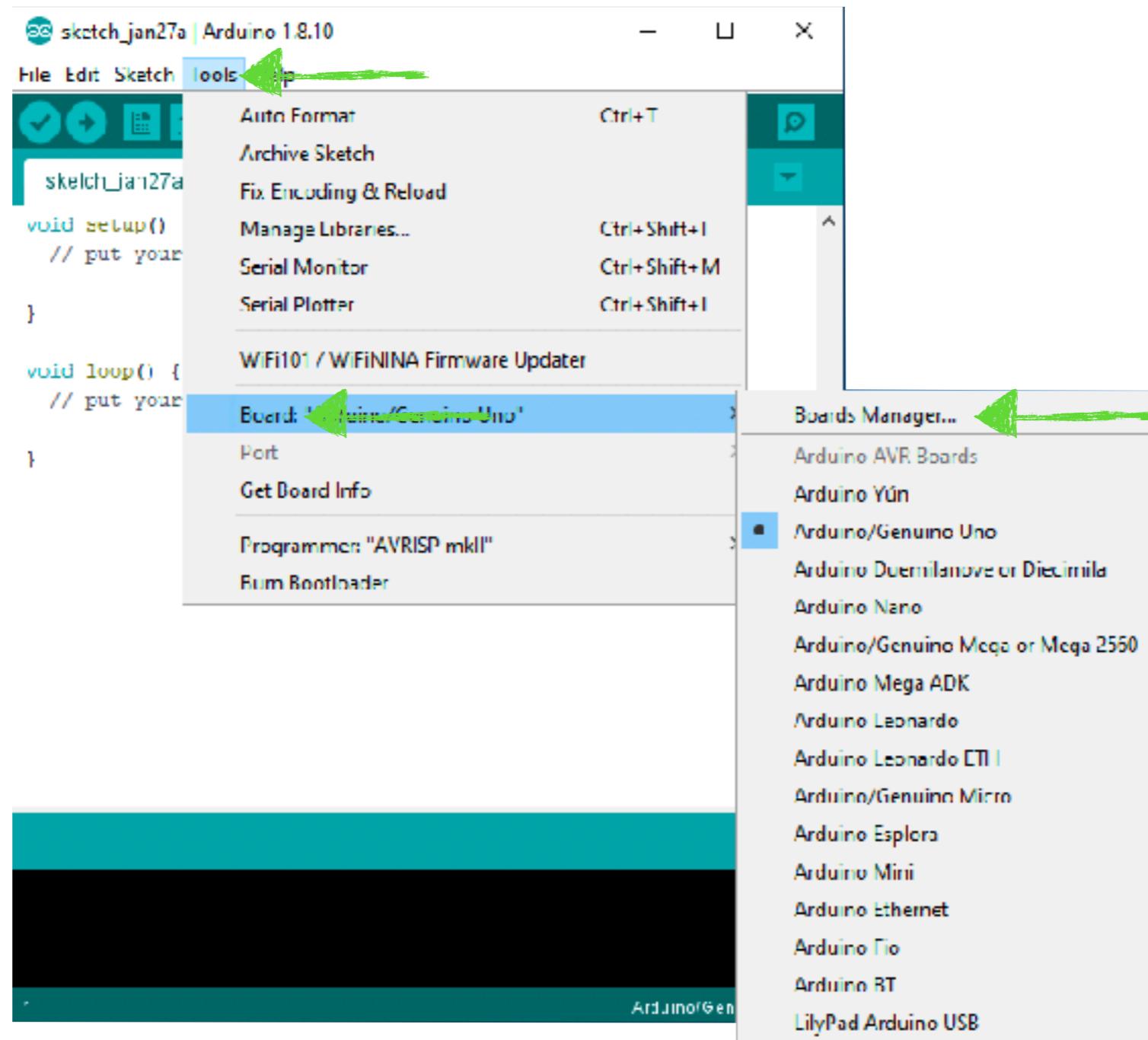
Additional Boards Manager URLs: [refresh icon]

More preferences can be edited directly in the file
C:\Users\Jason\AppData\Local\Arduino15\preferences.txt
(edit only when Arduino is not running)

OK Cancel

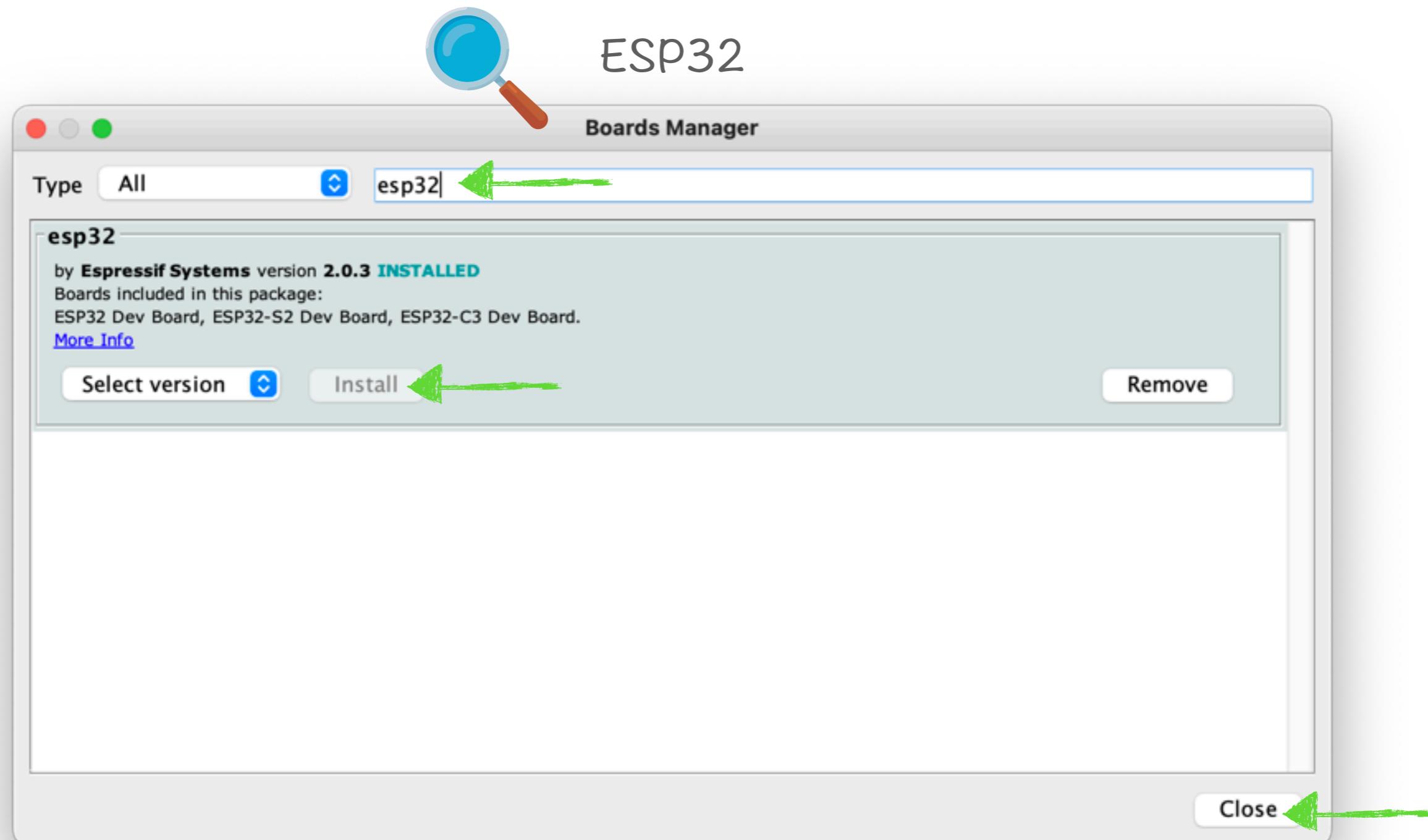


Software \ Add ESP32 Board to Arduino (5/7)





Software \ Add ESP32 Board to Arduino (6/7)





Software \ Add ESP32 Board to Arduino (7/7)

The screenshot shows the Arduino IDE interface on a Mac OS X system. The window title is "Arduino". The main area contains a sketch named "sketch_jun14a" with the following code:

```
1 void setup() {  
2 // put your setup code here, to run once  
3 }  
4  
5 void loop() {  
6 // put your main code here  
7 }  
8  
9 }
```

The "Tools" menu is open, displaying various options like Auto Format, Archive Sketch, and WiFi101 / WiFiNINA Firmware Updater. A dropdown menu for "Boards" is visible on the right, listing "Boards", "Arduino", "ESP32", "Mattair", "MediaTek", and "Seeed Studio". The "Board:" option in the "Tools" menu is set to "ESP32 Dev Module", which is highlighted with a blue selection bar. Two green arrows point from the text "Board: "ESP32 Dev Module"" to the selected item in the dropdown menu.

Board: "ESP32 Dev Module"
Upload Speed: "115200"
CPU Frequency: "240MHz (WiFi/BT)"
Flash Frequency: "80MHz"
Flash Mode: "QIO"
Flash Size: "4MB (32Mb)"
Partition Scheme: "Default 4MB with spiffs (1.2MB APP/1.5MB SPIFFS)"
Core Debug Level: "None"
PSRAM: "Disabled"
Arduino Runs On: "Core 1"
Events Run On: "Core 1"
Port
Get Board Info

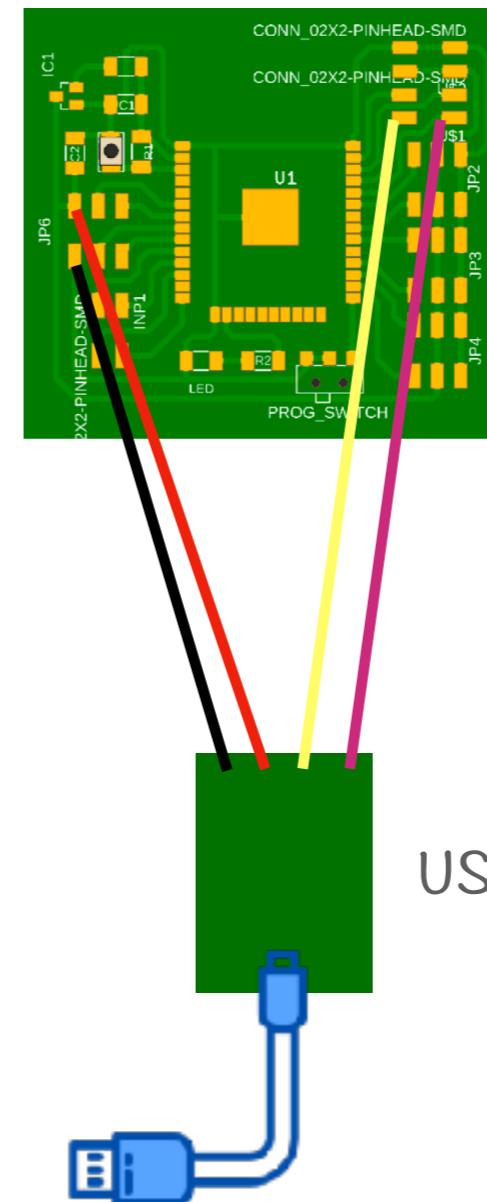
Programmer: "Esptool"
Burn Bootloader



Software \ Connect to Computer

Connect Q1 core to Computer

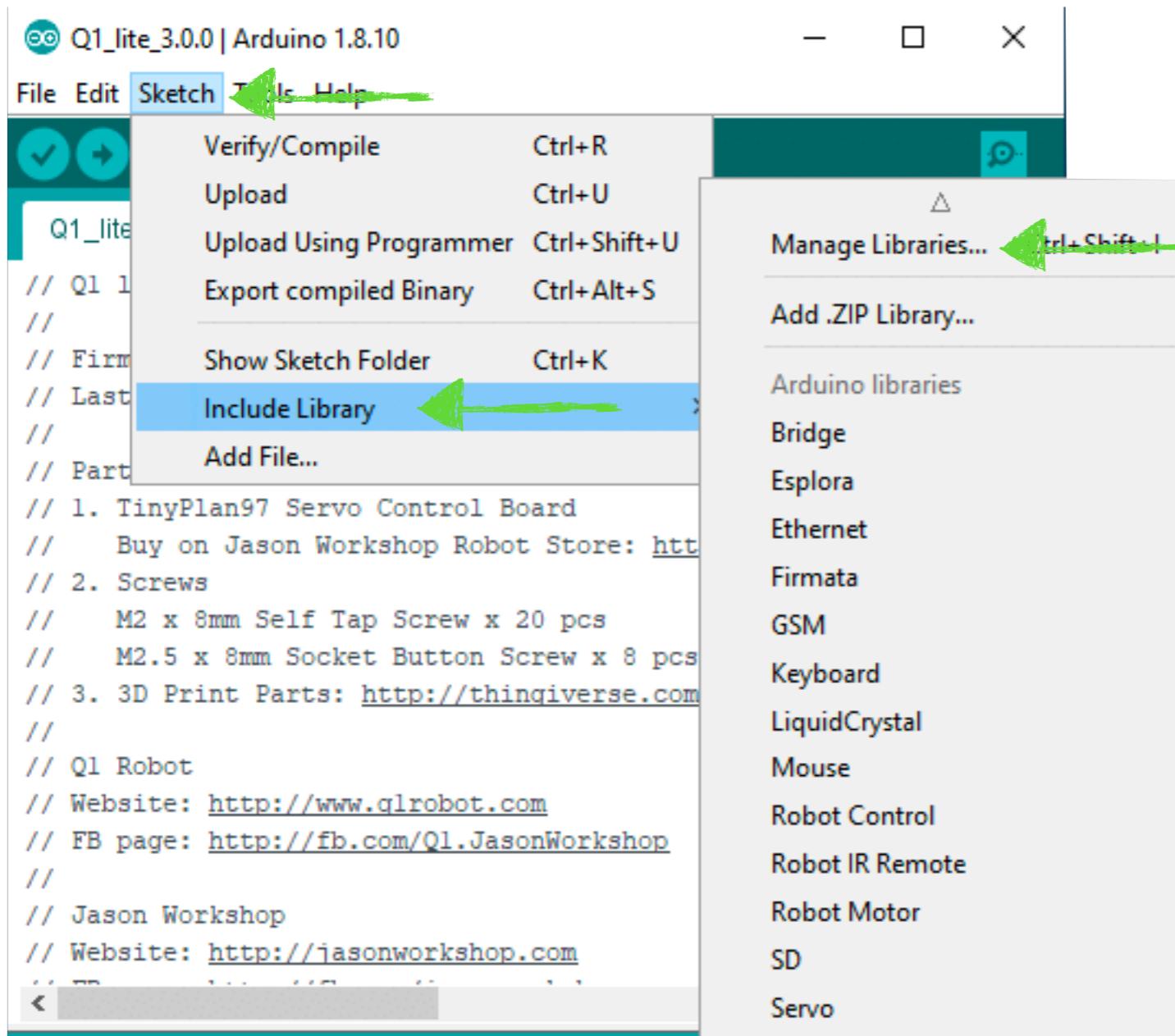
USB to UART	Q1 core board
5V+	VCC (5V)
GND	GND
TX	RX
RX	TX



USB to UART



Software \ Include Library



If need to include library, please go to top menu of Arduino IDE and choose **Sketch** > **Include Library** > **Manage Libraries** and search library you want to install.



Software \ Include Library

The screenshot shows the Arduino Library Manager window. In the search bar at the top right, the word "wifi" is typed. Three library entries are listed:

- WiFi**: Built-In by Arduino Version 1.2.7 INSTALLED. Described as enabling network connection (local and Internet) using the Arduino WiFi shield. It includes a "More info" link and dropdowns for "Version 1.2.6" and "Install". A green arrow points to the "Install" button.
- WiFi Link**: by Arduino. Described as enabling network connection (local and Internet) using the Arduino WiFi Boards. It includes a "More info" link. A green arrow points to the entry itself.
- WiFi101**: by Arduino. Described as enabling network connection (local and Internet) using the Arduino WiFi Boards. It includes a "More info" link.

A "Close" button is located in the bottom right corner of the window.



Software \ Download and Custom Q1 fab Program



Please download **Q1 fab Program** from:
www.jasonworkshop.com/q1fab



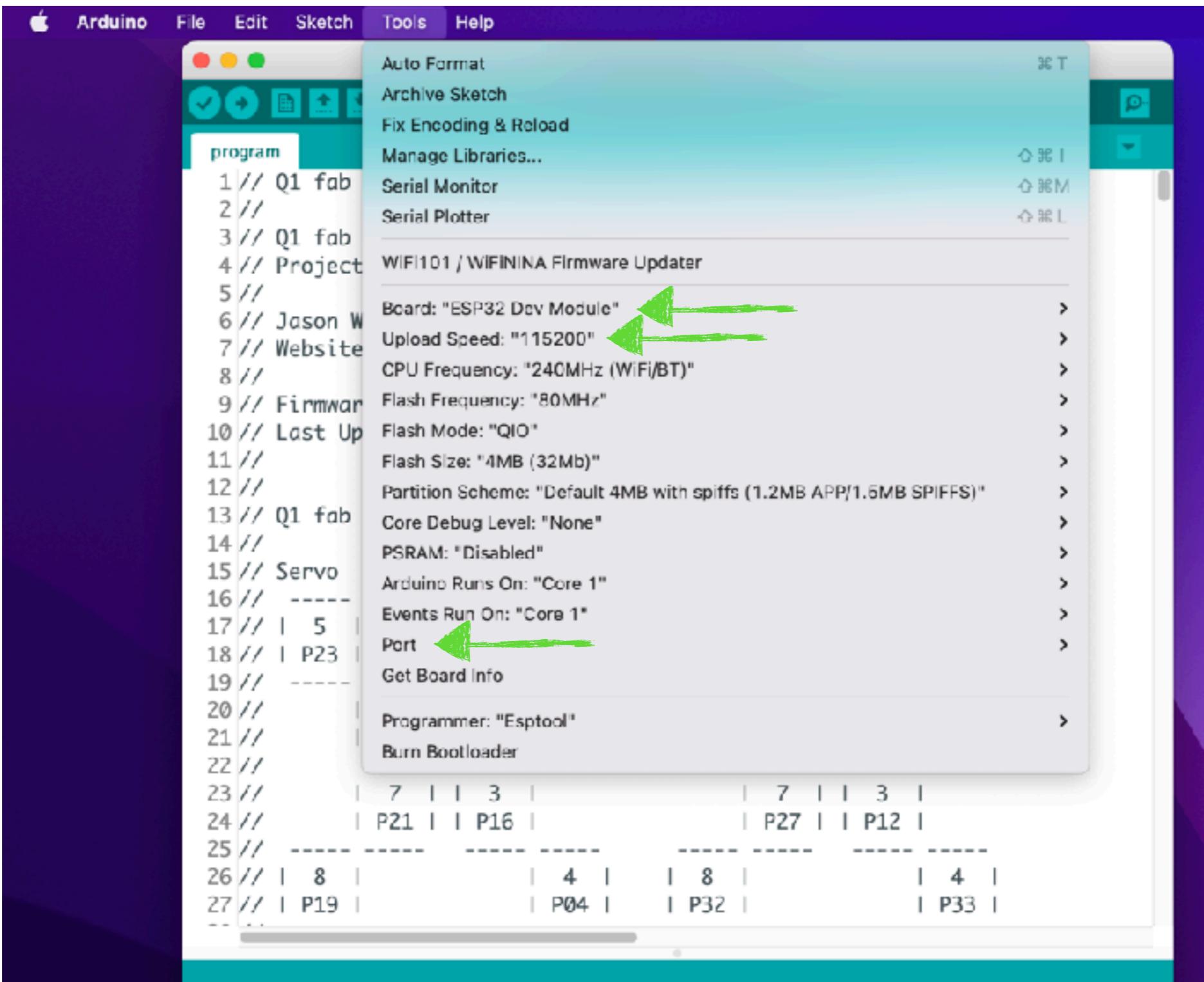
Software \ Download and Custom Q1 fab Program

```
program
47
48
49 // User define value
50 // -----
51
52 boolean angle_feed_back_mode = false; // Toggle feed back mode
53 boolean wifi_ap_mode = true; // true = be a WiFi AP; false = connect existing WiFi
54 // Toggle AP mode
55 // WiFi
56 const char* ssid = "Q1fab"; // SSID
57 const char* password = "12345678"; // WiFi password
58 WiFiServer server(80); // Set web server port number to 80
59
60 // -----
61
62
```

Please change your WiFi SSID and Password



Software \ Upload Program (1/2)



Q1 Robot @ Jason Workshop

www.jasonworkshop.com



Software \ Upload Program (2/2)

```
program | Arduino 1.8.19

program
39 /
40 // License Deed
41 // http://creativecommons.org/licenses/by-sa/4.0/
42 /
43 /
44
45 #include <WiFi.h>
46
47
48
49 // User define value
50 /
51
52 oolean angle_feed_back_mode = false;
53 oolean wifi_ap_mode = true; // true = be a WiFi AP; false = connect exist
54
55 // WiFi
56 const char* ssid = "Q1fab"; // SSID
57 const char* password = "12345678"; // WiFi password
58 WiFiServer server(80); // Set web server port number to 80
59
60 /
61
62
63
64 // System value
65 /
66

Done uploading.

Writing at 0x0000a17f4... (88 %)
Writing at 0x0000a6ea3... (92 %)
Writing at 0x0000cc740... (96 %)
Writing at 0x0000b1e74... (100 %)
Wrote 675856 bytes (434743 compressed) at 0x00010000 in 38.5 seconds (effective)
Hash of data verified.

Leaving...
Hard resetting via RTS pin...

F3 with soft fts (1.2MB APP/1.5MB SPI-FS, 240MHz (WiFi/ETH), QIO, 80MHz, 4MS (22Mbit), 115200, Core 1, Core 1, None on /dev/cu.usbserial-0001)
```



Q1 fab

Simple Quadruped Robot



Prepare Parts



3D Print



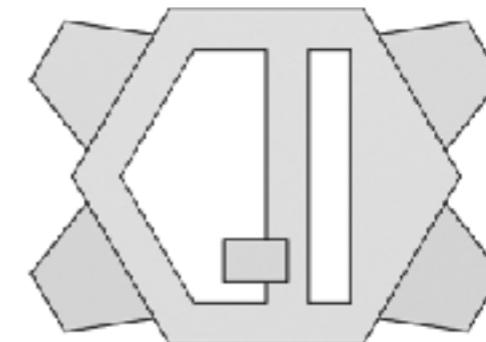
Software



Assemble



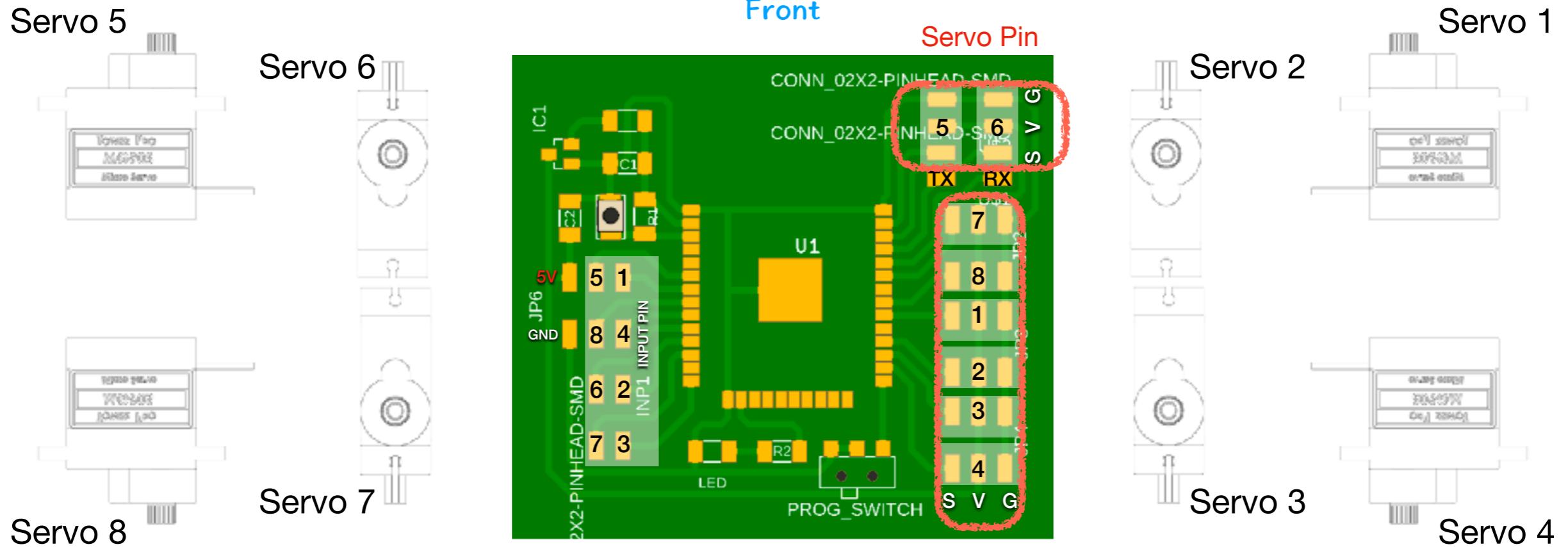
Play



Sumo Game

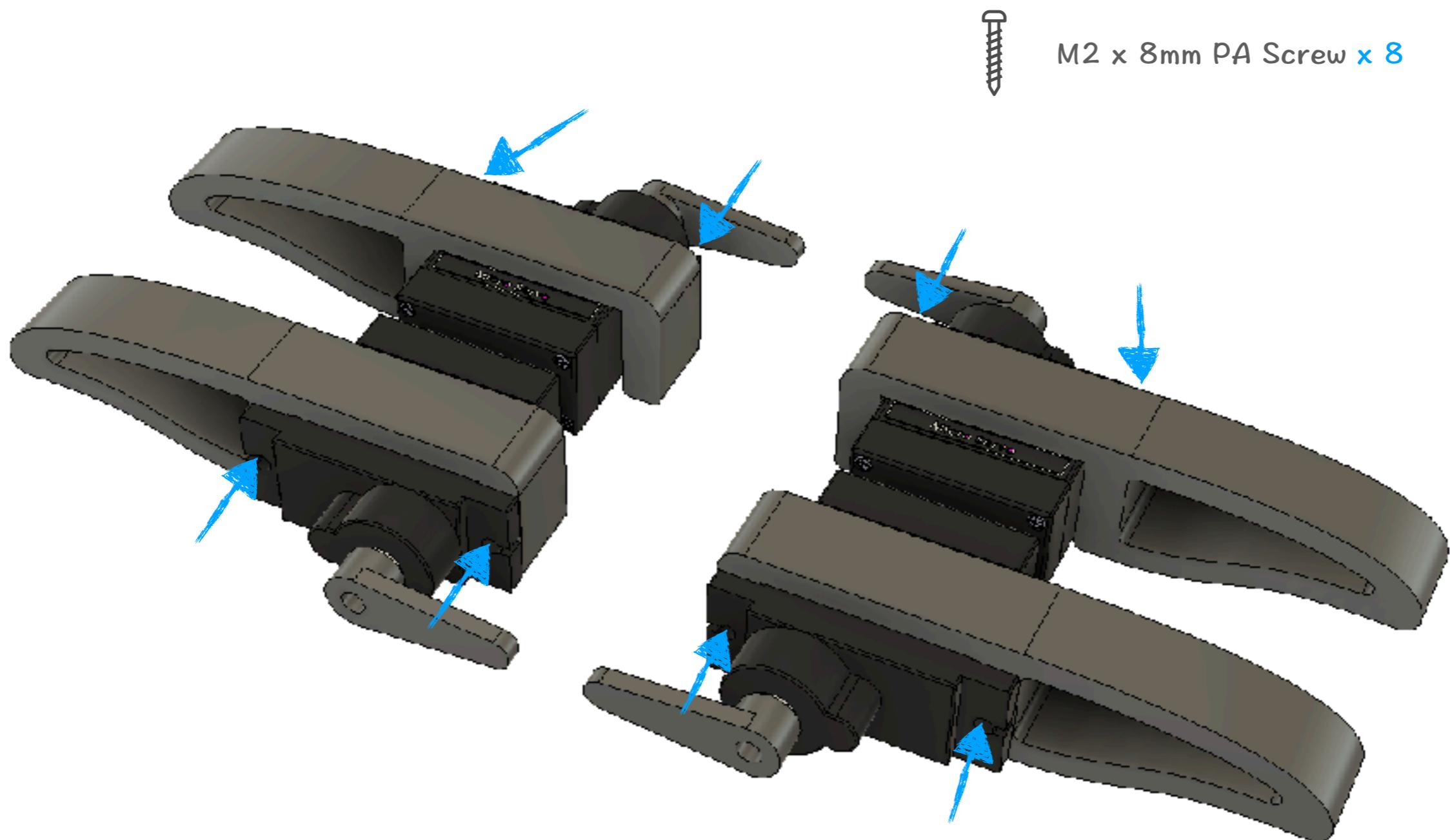


Assemble \ Connect Servo



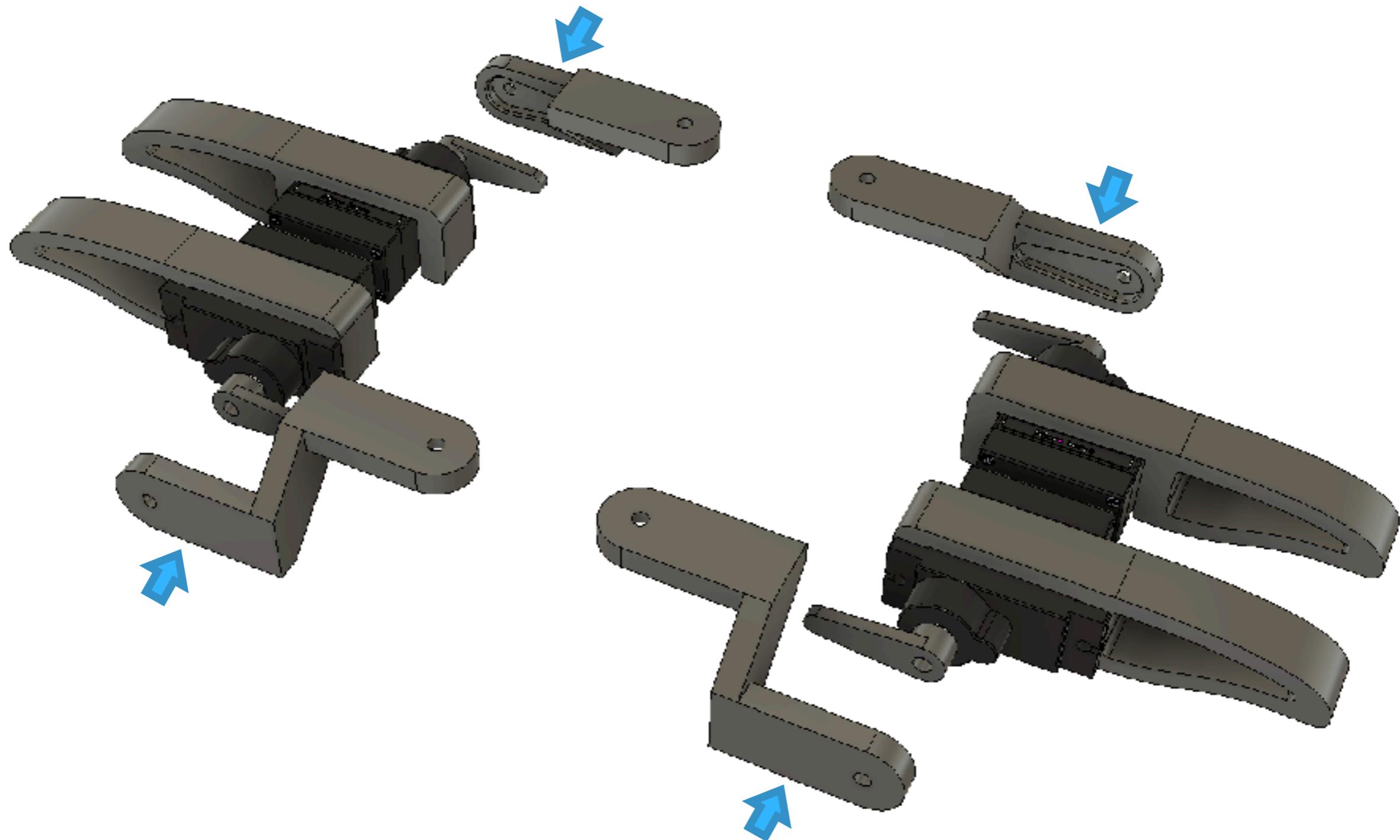


Assemble \ Leg (1/3)



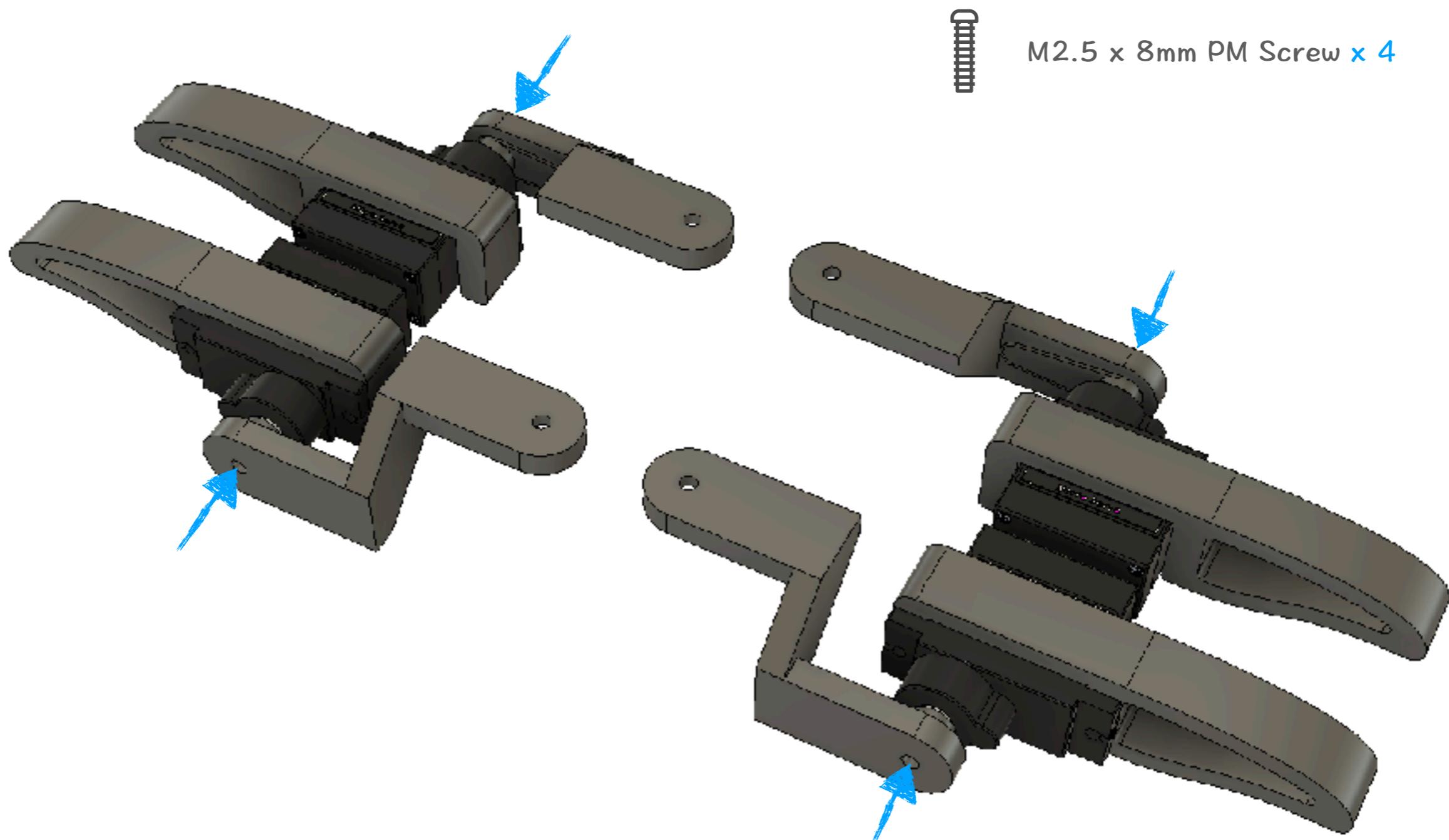


Assemble \ Leg (2/3)



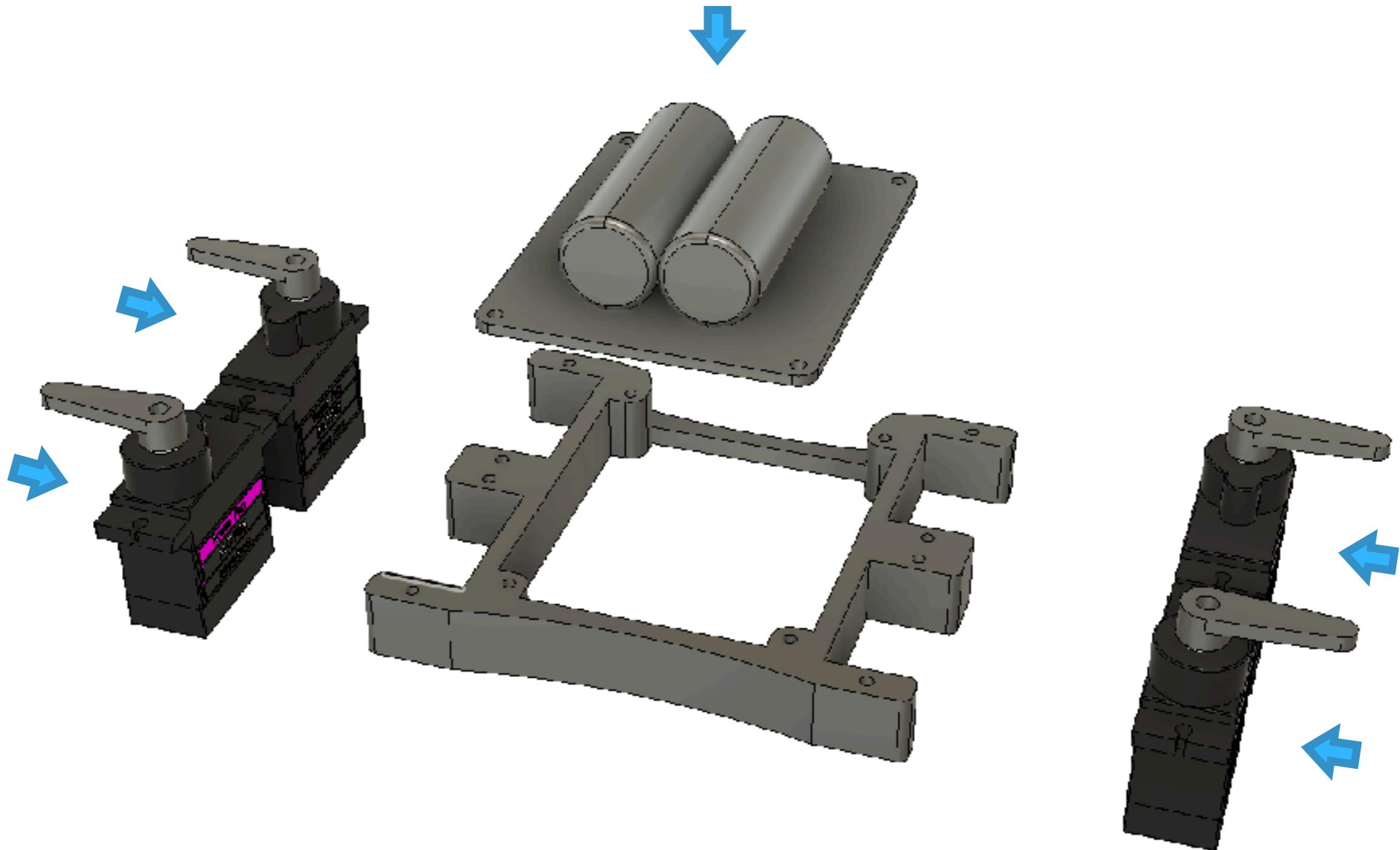


Assemble \ Leg (3/3)



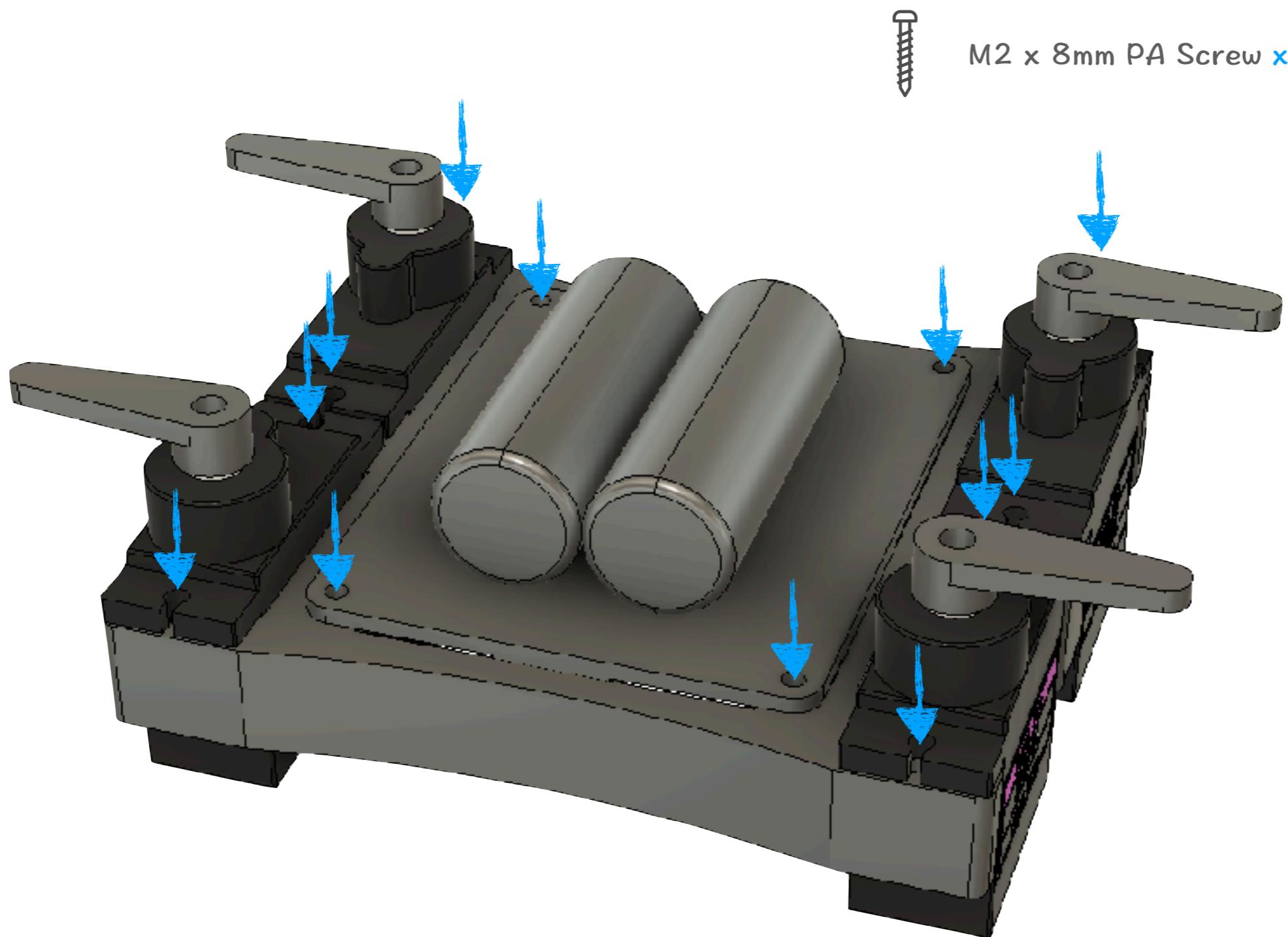


Assemble \ Body (1/2)



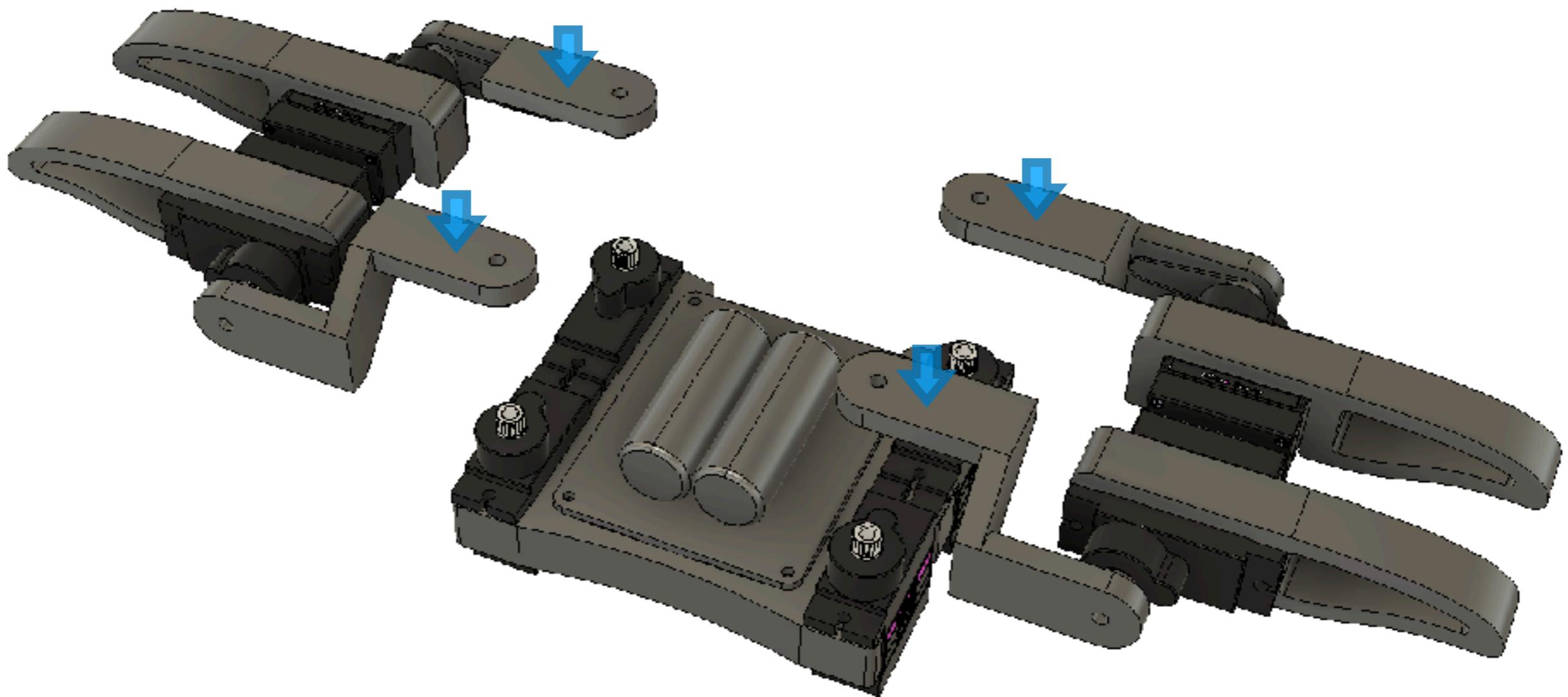


Assemble \ Body (2/2)



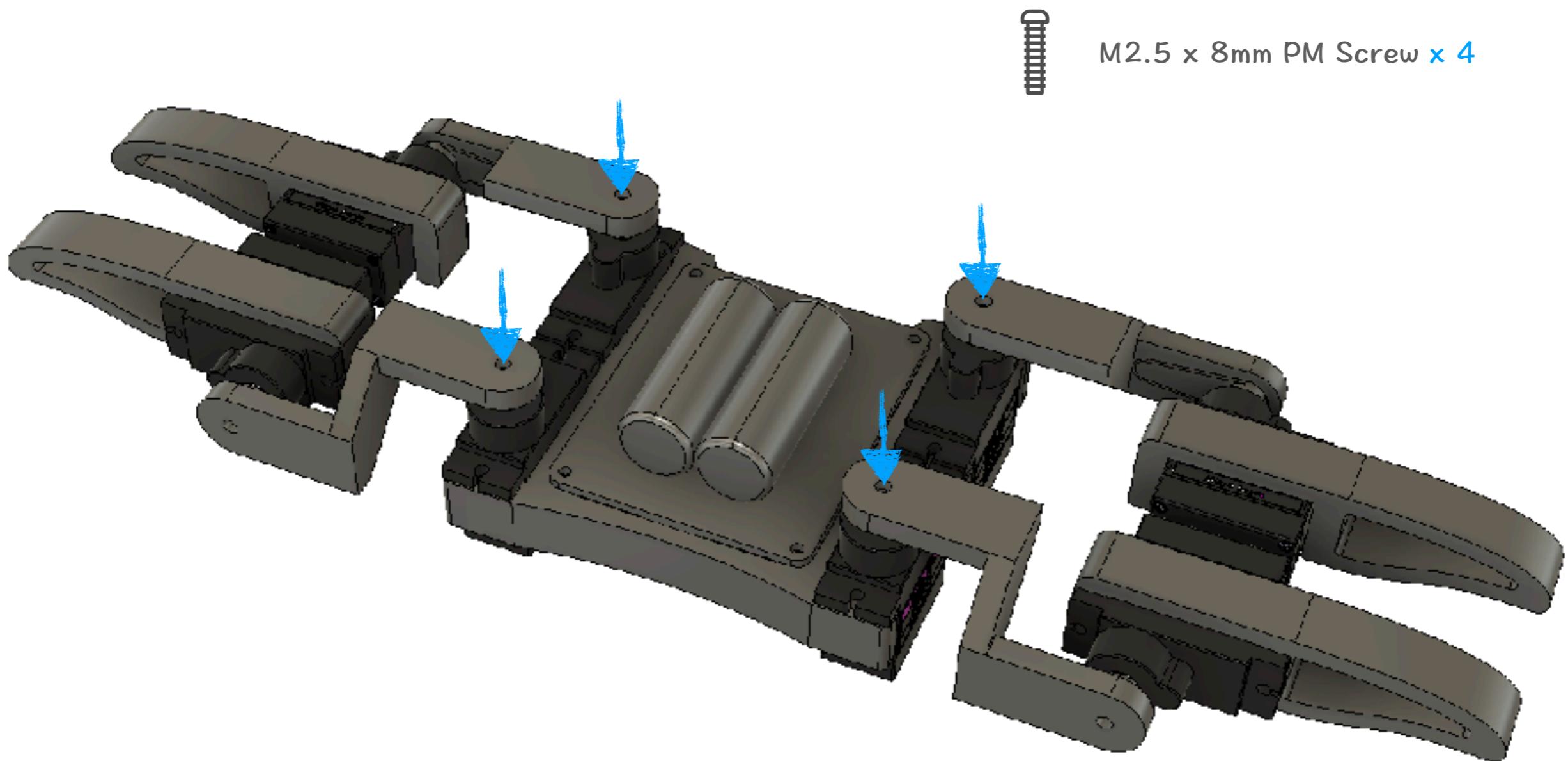


Assemble \ All together (1/3)





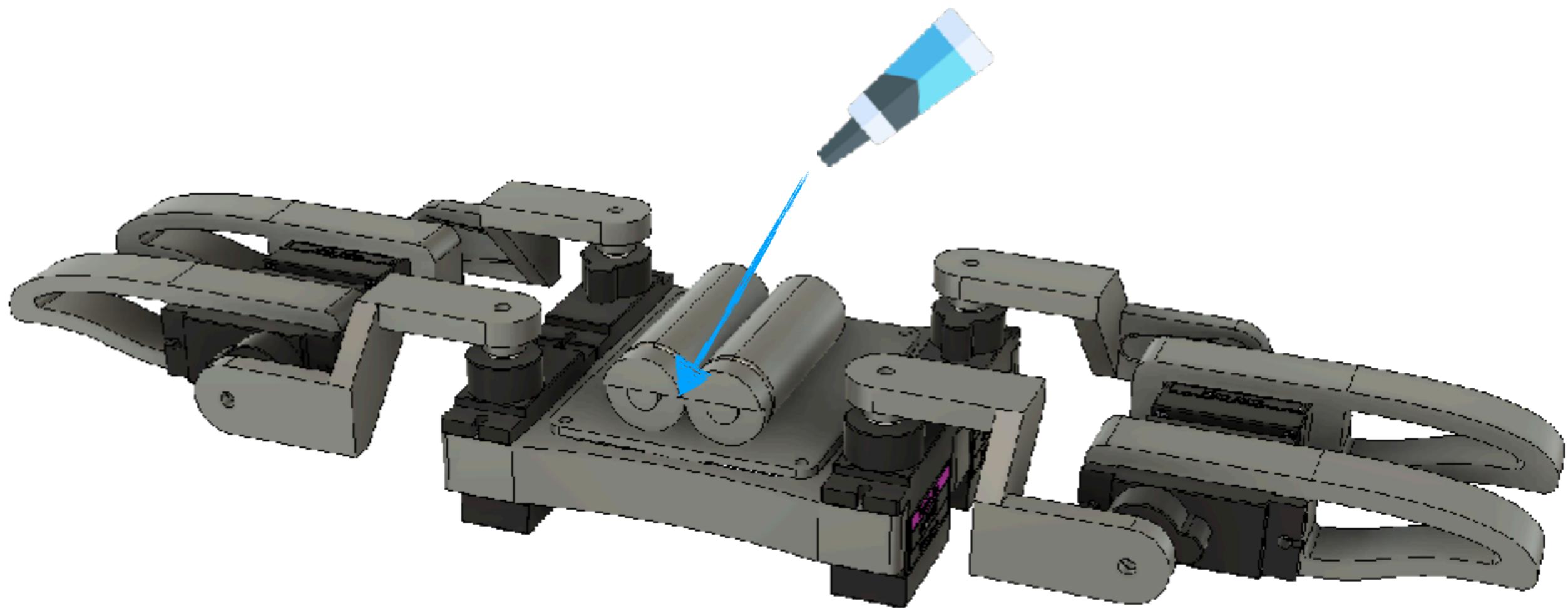
Assemble \ All together (2/3)



M2.5 x 8mm PM Screw x 4

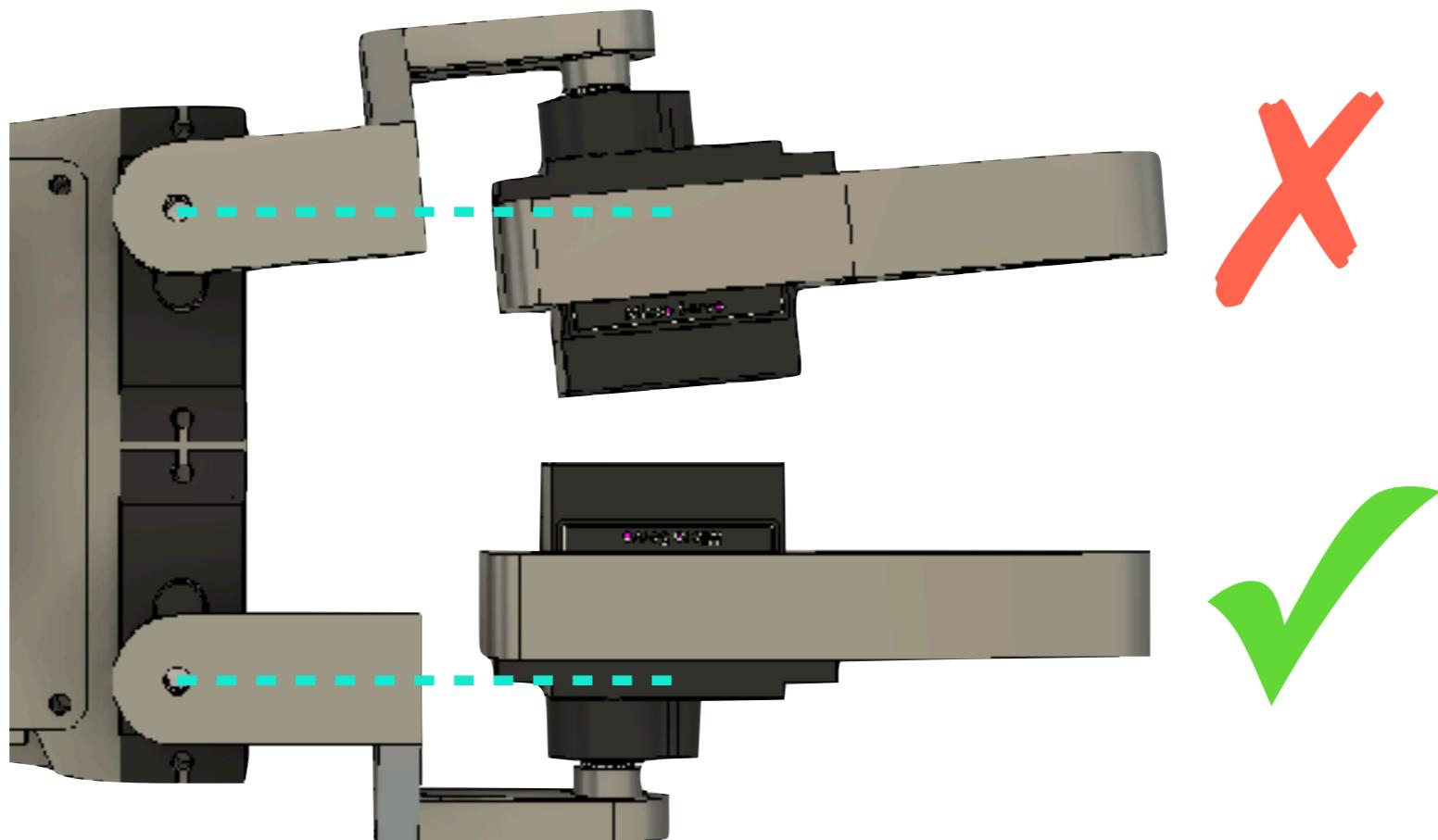


Assemble \ All together (3/3)



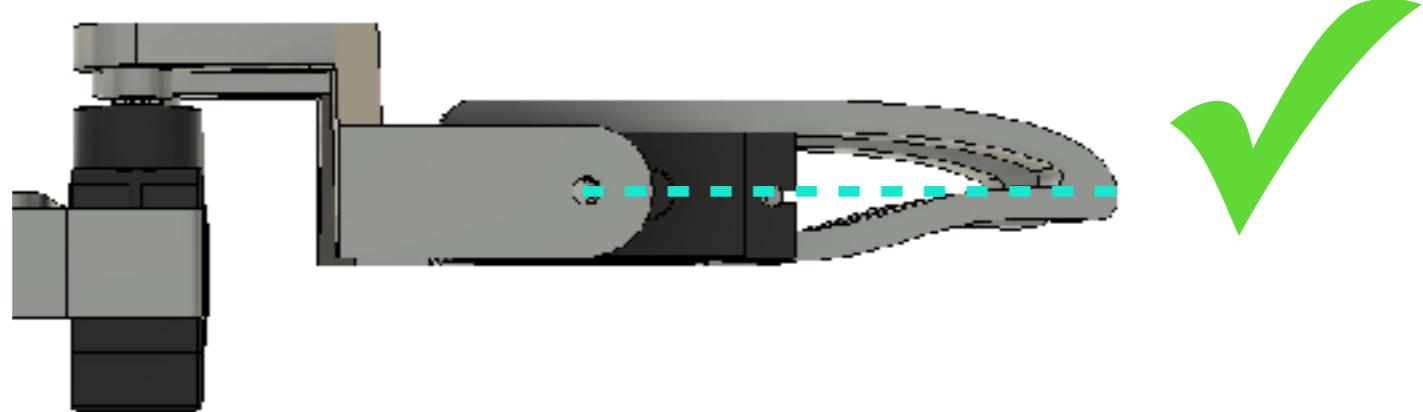
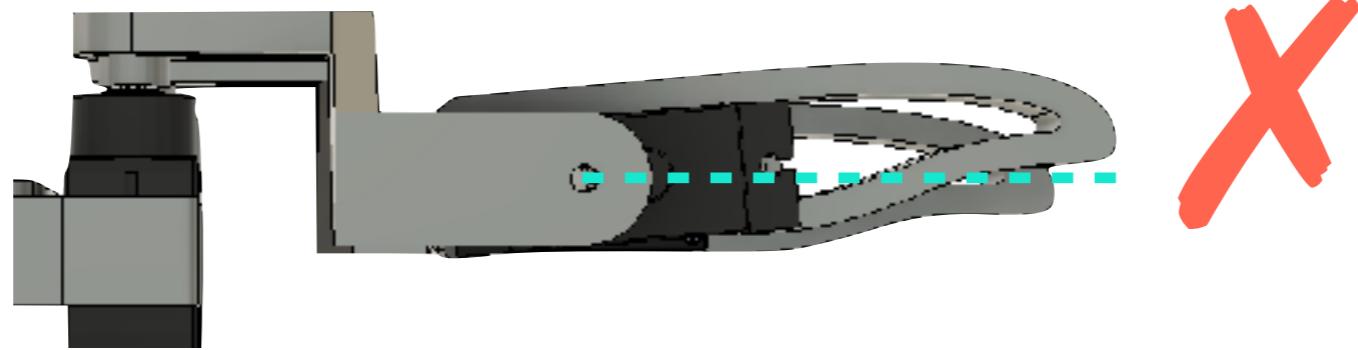


Assemble \ All together (3/3)



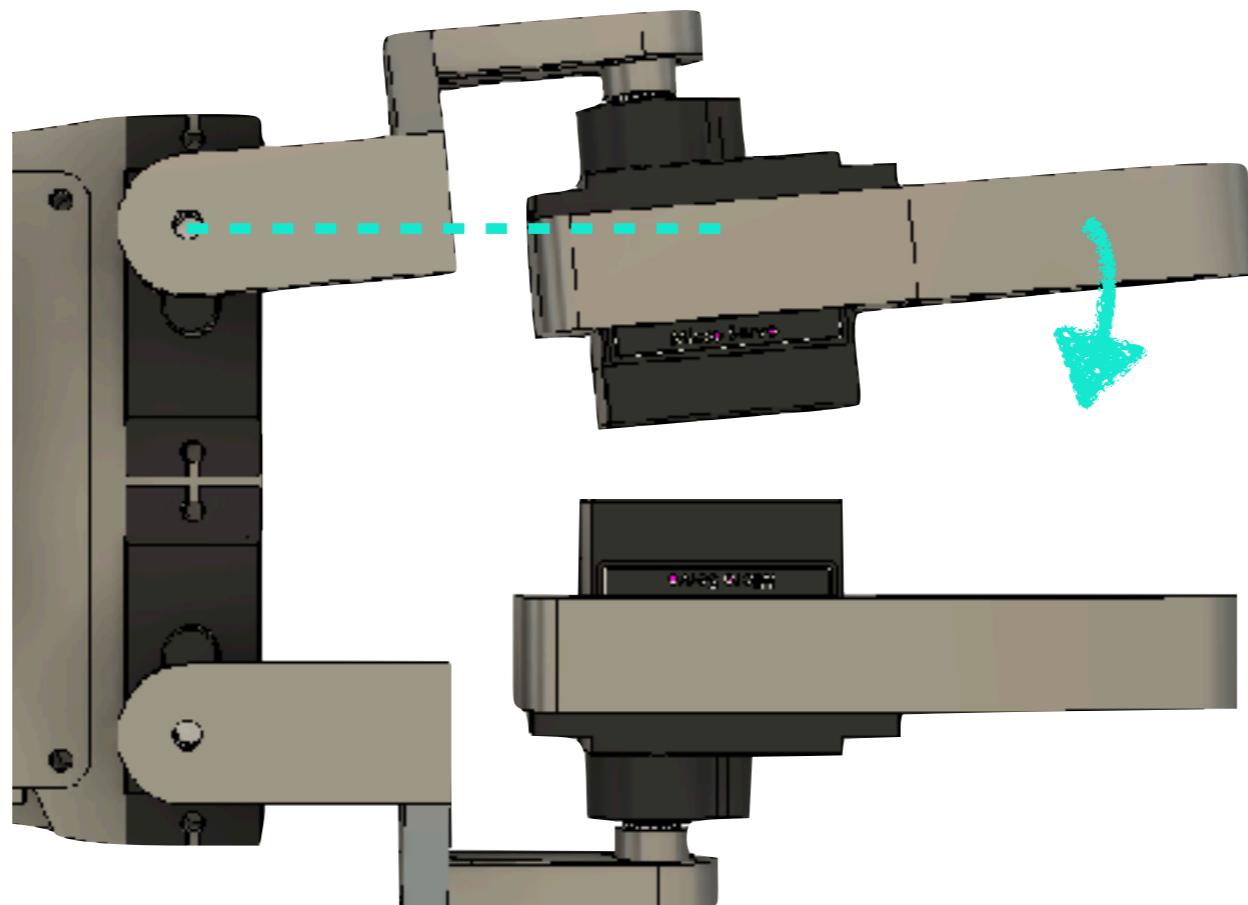


Assemble \ All together (3/3)





Assemble \ All together (3/3)



Q1 Robot @ Jason Workshop
www.jasonworkshop.com

Q1 fab

Simple Quadruped Robot



Prepare Parts



3D Print



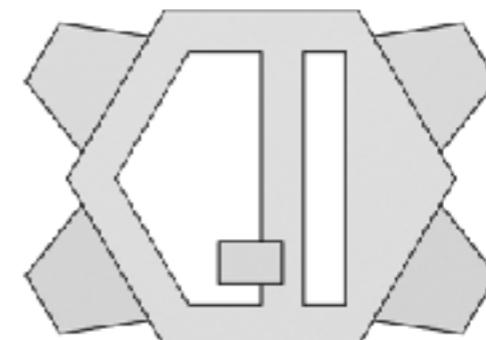
Software



Assemble



Play



Sumo Game



Play \ Connect to Q1 fab WiFi

Wi-Fi Settings (Left Screen):

- Wi-Fi toggle switch (On)
- Selected network: Q1fab (highlighted with an orange circle)
- Other networks listed:
 - jh8866
 - Linksys02519
 - Mowyukpan
 - 其他...
- 询问是否加入網絡 (Ask to join network):

已知的網絡會自動加入。如沒有可用的已知網絡，會通知你可用的網絡。
- 自動加入熱點 (Automatically join hotspots):

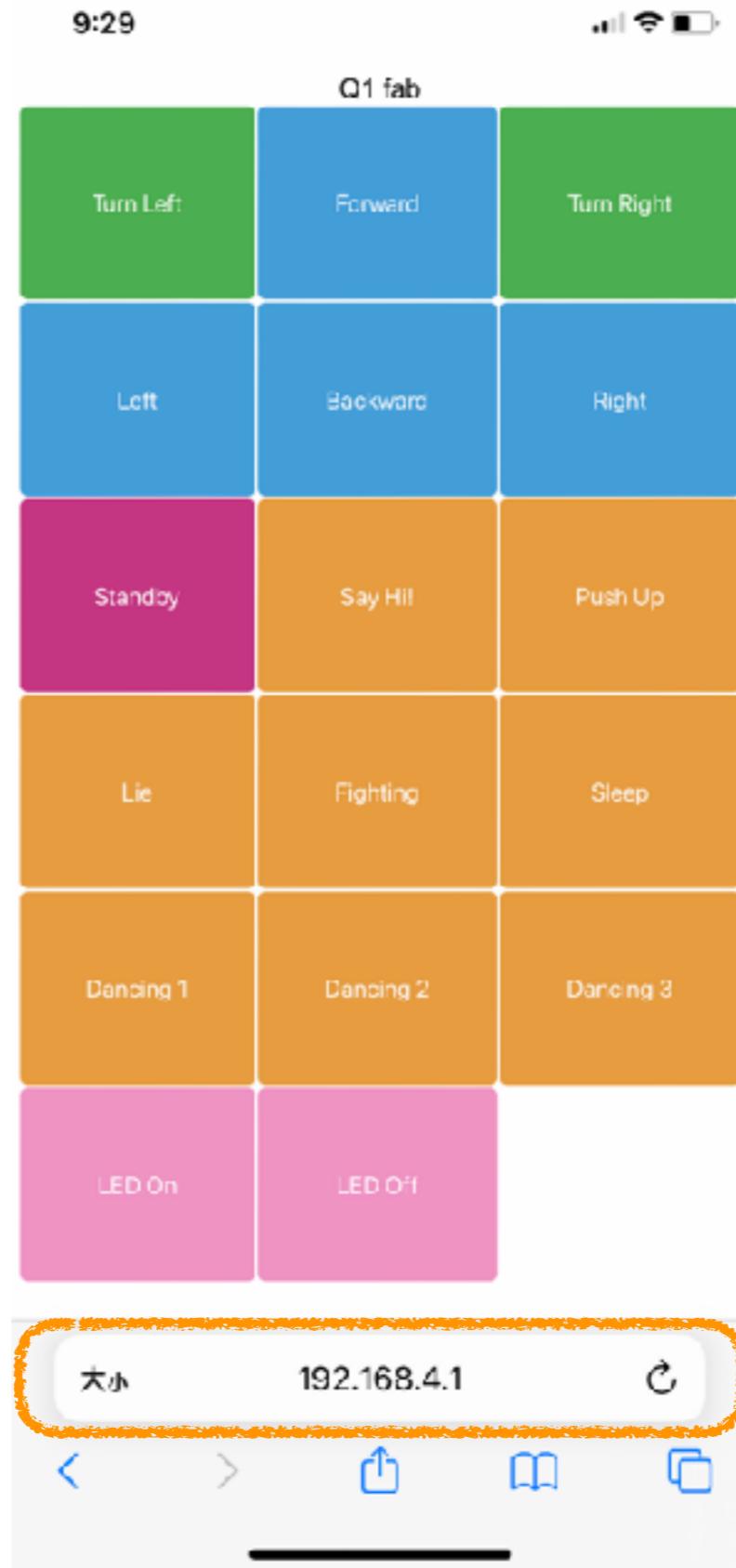
當 Wi-Fi 無法使用時，允許此裝置自動尋找附近的個人熱點。

Q1fab Network Configuration (Right Screen):

- 私人 Wi-Fi 地址 (Private Wi-Fi Address): On
- Wi-Fi 地址 (Wi-Fi Address): 1A:39:9A:36:F1:DF
- 使用私人地址有助你的 iPhone 在不同 Wi-Fi 網絡間減少被追蹤。
- 限制 IP 地址追蹤 (Limit IP address tracking): On
- IPV4 地址 (IPv4 Address):
 - 設定 IP (Set IP): 自動 >
 - IP 地址 (IP Address): 192.168.4.2
 - 子網路遮罩 (Subnet Mask): 255.255.255.0
 - 路由器 (Router): 192.168.4.1 (highlighted with an orange circle)
- DNS:
 - 設定 DNS (Set DNS): 自動 >
- HTTP 代理伺服器 (HTTP proxy server):
 - 設定代理伺服器 (Set proxy server): 關閉 >



Play \ Browse Q1 fab control interface



Q1 fab

Simple Quadruped Robot



Prepare Parts



3D Print



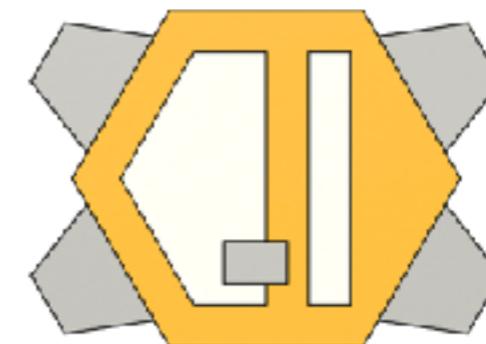
Software



Assemble



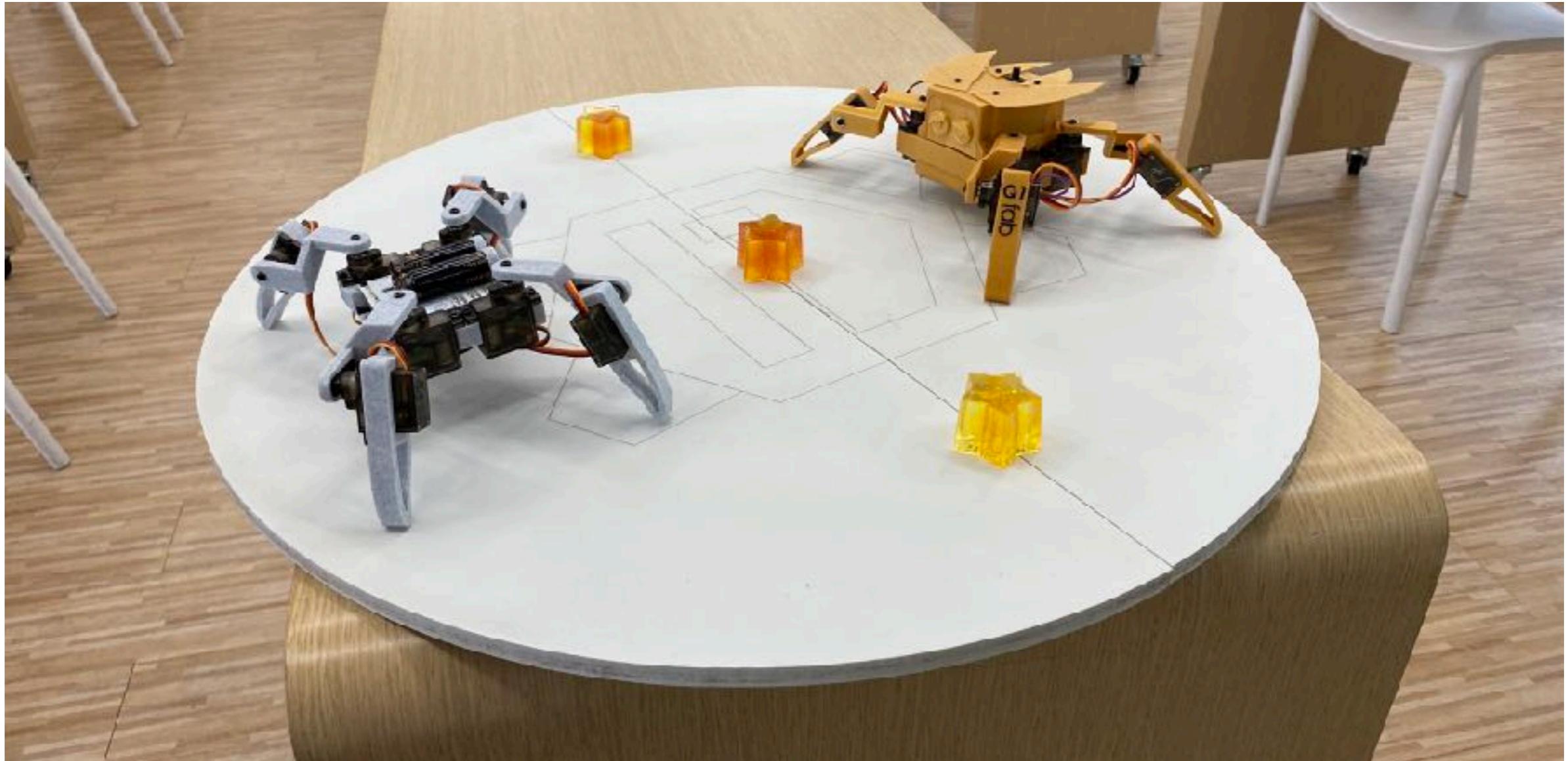
Play



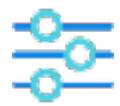
Sumo Game



Sumo Game



Q1 Robot @ Jason Workshop
www.jasonworkshop.com



Sumo Game

Scoring in Sumo Game

The objective of sumo game is to force your opponent out of the arena. (10 Point)

Or force bonus point out of the arena. (5 Point)

