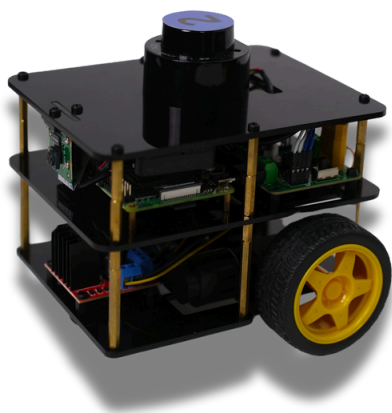


# FastBot

## Open-Source Robot Kit

### Assembly Instructions



SCAN ME



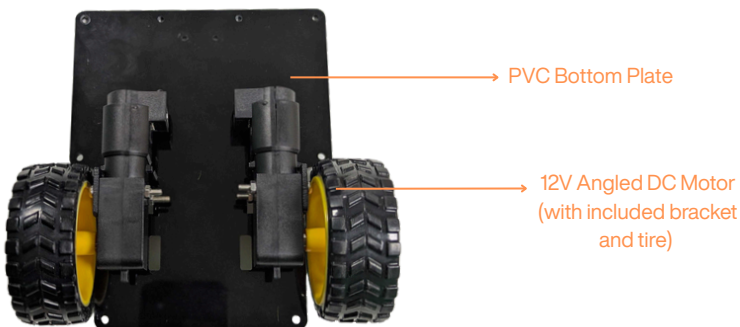
- Please read this manual carefully before starting the assembly process.
- If there are any differences between the illustrations and the actual product, the actual product shall take precedence.
- Keep this manual in a safe place for future reference.
- Scan the QR code on the left to watch the Botbox installation video tutorial.

# Item List

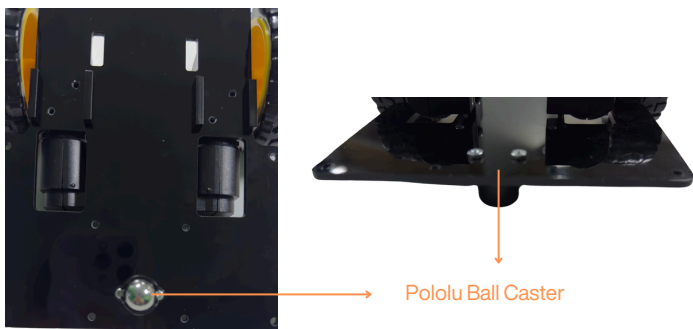
	12V Angled DC Motor (with included bracket and tire) ×2 12V 斜角直流电机 (附带支架和轮胎) ×2		Pololu Ball Caster ×1 Pololu 小球万向轮 ×1
	L298N Motor Drive Controller Board ×1 L298N 电机驱动控制板 ×1		DFRobot Power Module ×1 DFRobot 电源模块 ×1
	Raspberry Pi 4 ×1 树莓派 4 ×1		Raspicam ×1 Raspicam 摄像头模块 ×1
	LSLIDAR N10 ×1 LSLIDAR N10 激光雷达 ×1		Arduino Nano ×1
	20cm Dupont Cables (female-female) ×4 20 厘米杜邦线 (母对母) ×4		20cm Dupont Cables (male-male) ×2 20 厘米杜邦线 (公对公) ×2
	T-Connector Stripped Power Cable ×1 T型连接器剥皮电源线 ×1		USB-C Stripped Power Cable ×1 USB-C 剥皮电源线 ×1
	90 Degree USB to USB-C Cables ×2 90度 USB 转 USB-C 数据线 ×2		11.1V LiPo Battery 11.1V 锂聚合物电池 (LiPo 电池)
	SD Card ×1 SD 卡 ×1		M3 4cm Spacers (male-female) ×12 M3 4厘米支架 (公对母) ×12 Package 1
	M3 1cm Spacers (male-female) ×6 M3 1厘米支架 (公对母) ×6 Package 2		Nuts - M3 ×20 M3 螺母 ×20 Package 3
	M3 12mm Nylon Screws ×6 M3 12毫米尼龙螺丝 ×6 Package 4		M3 6mm Nylon Screws ×16 M3 6毫米尼龙螺丝 ×16 Package 5
	M3 6mm Nylon Spacers (male-female) ×8 M3 6毫米尼龙支架 (公对母) ×8 Package 6		M2 20mm Screws ×2 M2 20毫米螺丝 ×2 Package 7
	M2 8mm Screws ×4 M2 8毫米螺丝 ×4 Package 8		M2.5 10mm Spacers ×4 M2.5 10毫米支架 ×4 Package 9
	M2.5 Nuts ×4 M2.5 螺母 ×4 Package 10		M2.5 6mm Screw ×4 M2.5 6毫米螺丝 ×4 Package 11
	M2 Nuts ×4 M2 螺母 ×4 Package 11		11.1V LiPo battery charger 11.1V 锂聚合物电池 (LiPo 电池) 充电器
	PVC Sheets ×5 PVC 板 ×5		

# Assembly Instructions

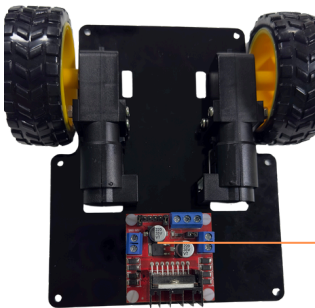
## Step 1: Attach motors to bottom plate



## Step 2: Attach ball caster to bottom plate

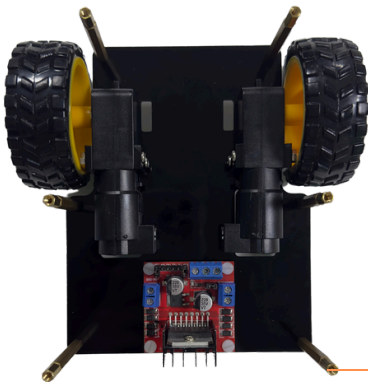


**Step 3:** Attach L298N to bottom plate



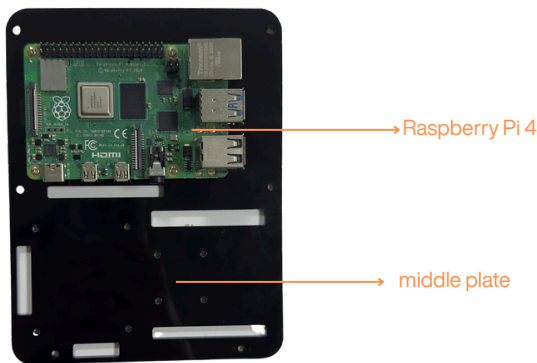
L298N Motor Drive  
Controller Board

**Step 4:** Attach 6 x (4cm + 1cm) spacers to bottom plate

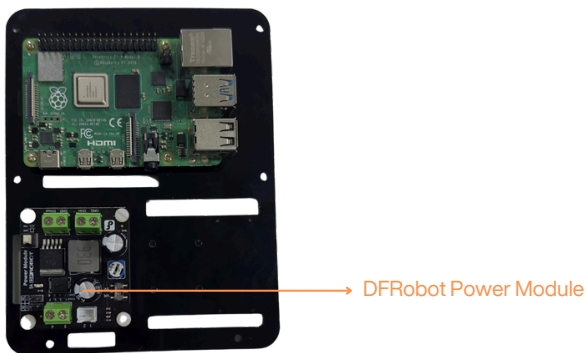


Package 1  
M3 4cm Spacers (male-female)

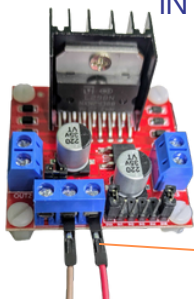
## Step 5: Attach Raspberry Pi to middle plate



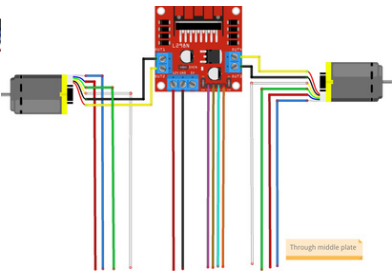
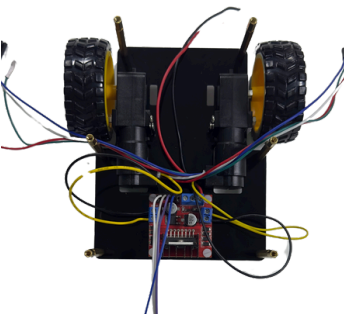
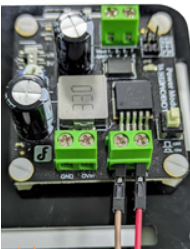
## Step 6: Attach power module to middle plate



**Step 7:** Connect motor wires to motor. Connect motor power to L298N. Connect female-female dupont wires to L298N IN terminals.

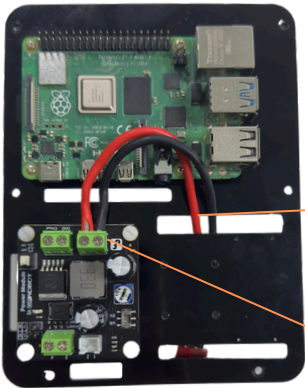


20cm Dupont Cables (male-male)



fritzing

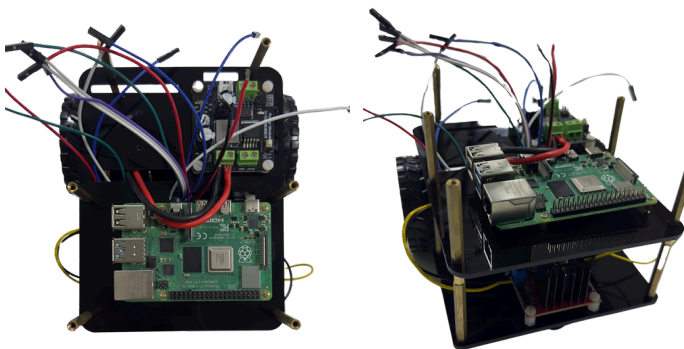
**Step 8:** Connect T-connector cable to power module (Vin, GND)



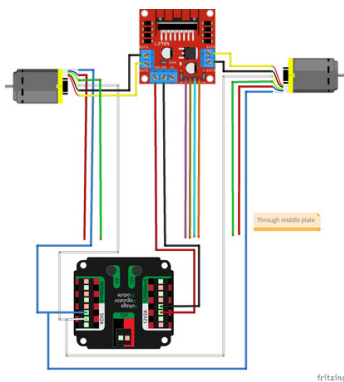
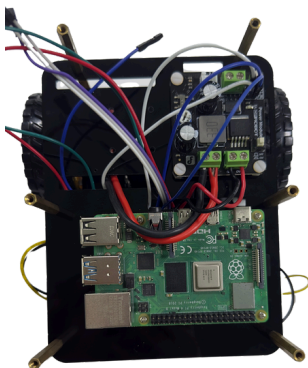
Insert the cable under the middle plate

T-Connector Stripped Power Cable

**Step 9:** Put all cables through middle hole in middle plate. Attach middle plate to bottom plate with 4cm spacers.



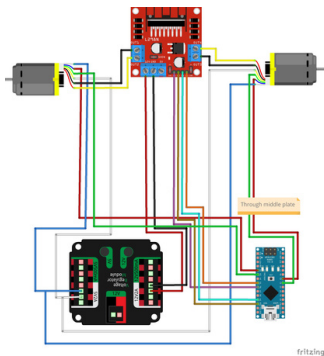
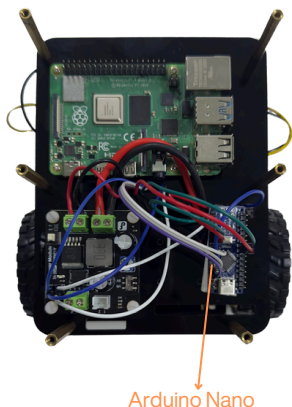
**Step 10:** Connect Power cables from power module to L298N. Connect encoder power cables to power module.



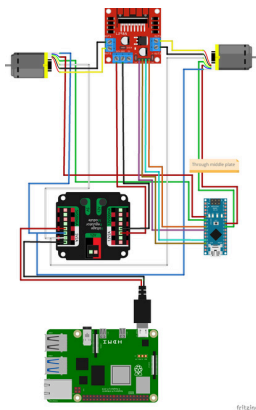
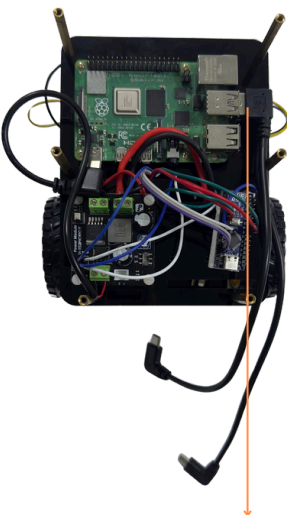
Connecting the IN pins of the L298N to the microcontroller:

- IN1 → D6
- IN2 → D10
- IN3 → D9
- IN4 → D5

**Step 11:** Connect encoder phase cables to arduino nano. Connect L298N IN cables to arduino nano



**Step 12:** Connect Raspberry pi to power module  
Connect USB cables to Raspberry pi



Connecting the motor encoder signal wires to the microcontroller:

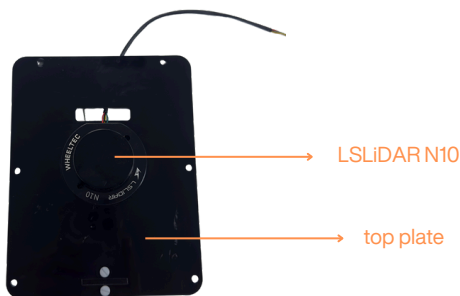
- Encoder A phase output of Motor A → D3
- Encoder B phase output of Motor A → D2
- Encoder A phase output of Motor B → A4
- Encoder B phase output of Motor B → A5



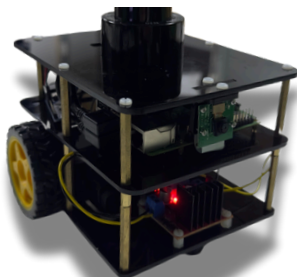
**Step 13:** Attach raspicam to camera plate. Attach camera plate to top plate through camera lock plate. Screw in lock plate with nylon screws.



**Step 14:** Attach LSLiDAR to top plate. Put cable through hole.



**Step 15:** Attach top plate to bottom and middle plates with nylon screws.



Final Assembly View

# 11.1V Lithium Polymer (LiPo) Battery Safety

## 1. Avoid Overcharging and Overdischarging

- Overcharging: The charging voltage of a LiPo battery should be strictly controlled at about 4.2V per cell. Avoid exceeding this voltage to prevent battery overheating or explosion.
- Overdischarging: Do not allow the battery voltage to drop below 3.0V per cell. Overdischarging may cause capacity loss or even lead to short circuits or fire.

## 2. Use a Suitable Charger

- Always use a charger specifically designed for LiPo batteries, and ensure the charger supports the appropriate battery voltage and current.
- Never use a regular charger (e.g., a phone charger) to charge a LiPo battery.

## 3. Avoid Exposure to High Temperatures

- LiPo batteries should be kept away from high-temperature environments. The optimal operating temperature is usually between 0°C and 45°C.
- When charging, ensure the battery and charger are placed in a dry, well-ventilated area, away from heat or direct sunlight.

## 4. Avoid Physical Damage

- Do not squeeze, puncture, or strike the battery with force. Physical damage may cause internal short circuits or fire.
- If the battery swells or overheats abnormally during charging or use, stop using it immediately and dispose of it safely.

## 5. Storage Precautions

- When storing LiPo batteries for a long time, keep the charge level between 40% and 60%.
- Store in a dry, cool place, avoiding humidity and high temperatures.
- Ensure batteries are stored in specialized fireproof bags or metal containers to prevent accidents.

## 6. Prevent Short Circuits

- Make sure the battery terminals do not come into contact with metal objects to avoid short circuits.
- Properly protect battery terminals to prevent exposed contacts from touching other objects.

## 7. Monitor Battery Temperature

- Regularly check the battery temperature during charging and use. If the battery becomes overheated, stop using it immediately.
- Generally, the battery temperature should remain near room temperature during operation, as overheating can damage the battery or cause safety hazards.

## 8. Avoid Moisture Contact

- LiPo batteries must not be used in damp or wet environments. Moisture can cause short circuits and damage the battery.

## 9. Disposal of Used Batteries

- Do not discard used batteries casually. Follow local environmental regulations for recycling or disposal.
- Ensure the battery is fully discharged before disposal.

## 10. Follow Battery Usage Instructions

- Read and follow all safety guidelines and user manuals provided by the battery manufacturer to understand specific usage requirements and limitations.

## 11. Regularly Inspect Battery Condition

- Periodically inspect the battery's appearance for swelling, deformation, or other damage. If any abnormalities are found, stop using the battery immediately and take appropriate action.

## Important Notice:

- Users are strongly advised to read this specification carefully, especially the parameter specifications and precautions, to fully understand the proper usage and application scope of the product.
- Any issues arising from incorrect usage, improper circuit connections, or the use of input power supplies and load parameters that do not conform to the specifications listed in this document shall be considered as improper use.
- Our company shall not be held responsible for any damage to the product, the load, or any connected peripherals resulting from such improper use.

**Intended Users:** Ages 16 and above

**Product Name:** FastBot Open-Source Smart Robot Kit

**Technical Support Email:** info@theconstruct.ai

**Manufacturer:** The Construct Robotics Institute