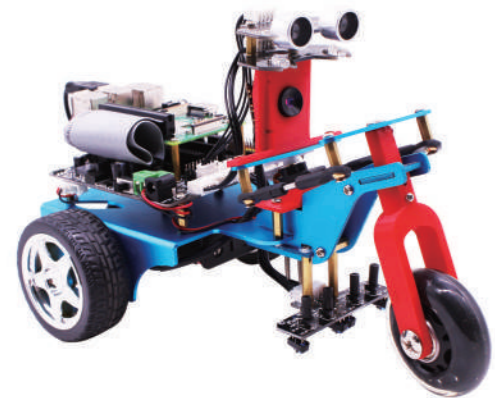




# Raspberry Pi Trikebot smart car manual



- 1 Please read this manual carefully before use
- 2 The company reserves the right of interpretation for this manual
- 3 Product appearance, please prevail in kind
- 4 Please keep the manual properly after reading

## Introduction

The Trikebot Smart Tricycle is an open source hardware educational robot with front wheels that are turned by mechanical mechanisms.

The smart cars that are common in the market can only be steered by the differential speed of the wheels, and the design of the Trikebot makes the steering more flexible and diversified with the differential steering.

In addition to its unique steering control design, Trikebot also supports a number of custom-made sophisticated sensors that can be easily programmed through programming, line-crossing, obstacle avoidance, and remote control.

## About us

Shenzhen Yahboom Technology Co., Ltd. is a professional company specialized in open source hardware and maker education. We have two Enterprise Concept: turn ideas into reality and Let more children become maker. Company's products now have covered early childhood education, intelligent robot education, university automation technology education, and so on. In addition, the company provides long-term help and products for colleges and training institutions to develop a training program. Shenzhen Yahboom Technology Co., Ltd. is a professional company specialized in open source hardware and maker education. We have two Enterprise Concept: turn ideas into reality and Let more children become maker. Company's products

## Source code

Raspberry Pi source code link:  
<https://drive.google.com/open?id=175Gv8o4ukMqPLa0BWJxaQGVSmJZWbTsi>

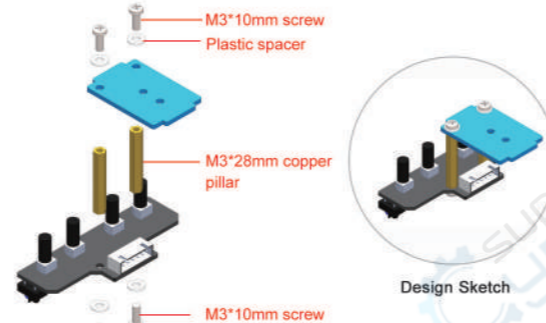
## Component List

	Aluminum alloy chassis x1		4wd expansion board x1
	M2*5mm screw x3 M3*10mm screw x30 M3*16mm screw x3 M2.5*6 screw x6 M3*30mm screw x4 M3 nut x10 Screw x2		Motor x2
	18650 battery box x1		12.6V Battery charger x1
	18650 Lipo battery x3		Bluetooth 4.0 module x1
	Screwdriver x1		Pulley x1
	Tyre x2		Accessories x1
	Servo package x1		Ultrasonic module x1 M3*8mm screw x2 M3*5mm screw x2 M3*12mm copper pillar x2 4pin cable x1
	Colorful searchlight x1 M3*10mm screw x2 M3*5mm screw x2 4pin cable x1		4 Channel track module x1 M3*8mm screw x4 M3*28mm copper pillar x2 8pin cable x1
	Plastic spacer x n		M3*12mm copper pillar x4 M3*16mm copper pillar x9
	HD camera x1 camera cable x1 M2.5*10mm screw x3		Raspberry Pi 3+ controller x1 (Option)

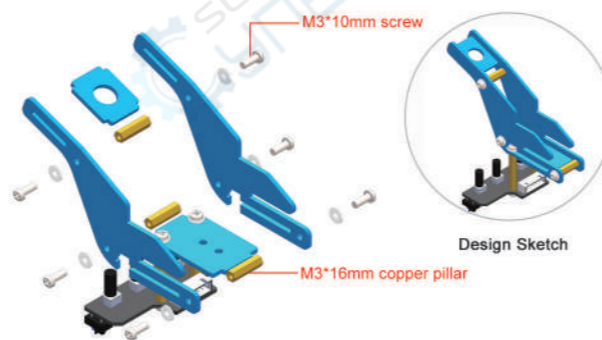
	40pin cable x1		8G SD card x1 Heat sink x1 (Option)
	M2.5*20mm copper pillar x4 M2.5*6mm screw x8		

## Installation instructions

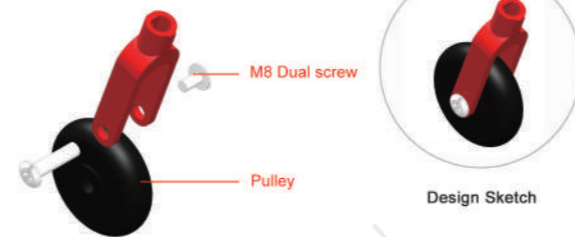
### 01 4 Channel tracking module assembly



### 02 Aluminum alloy assembly



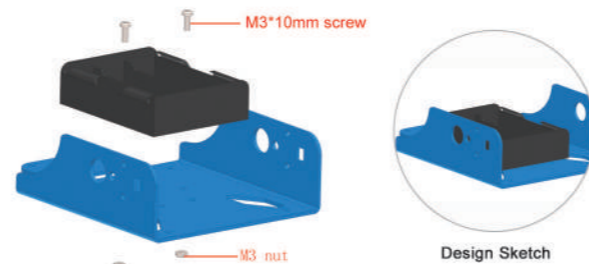
### 03 Pulley assembly



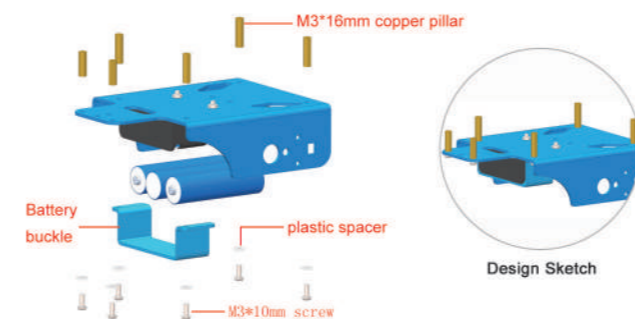
### 04 Aluminum alloy and fork assembly



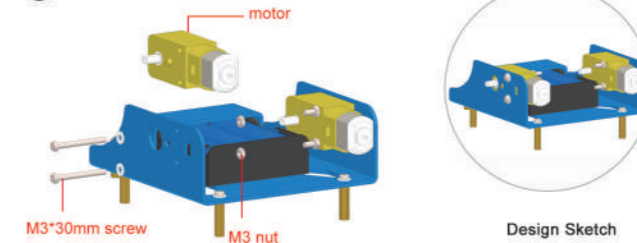
### 05 Battery box assembly



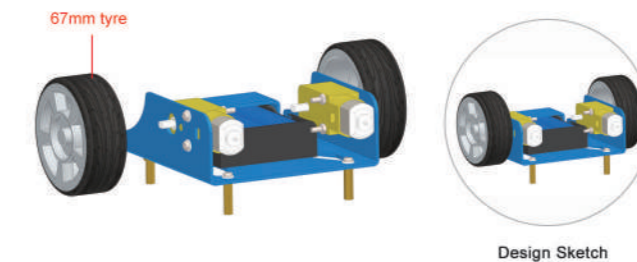
### 06 Battery buckle and copper pillar assembly



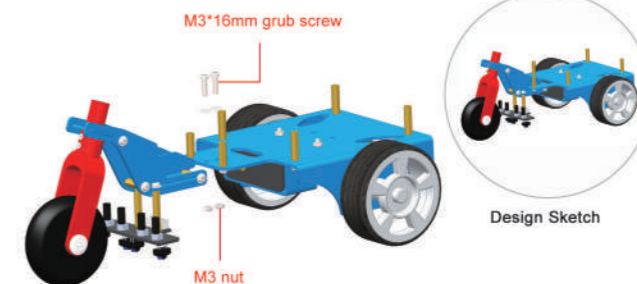
### 07 Motor assembly



### 08 Tyre assembly



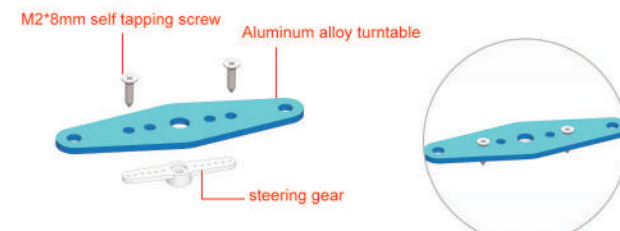
### 09 Aluminum alloy chassis assembly



### 10 Metal servo assembly



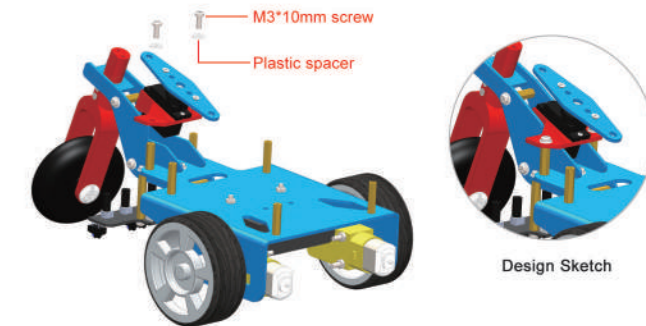
### 11 Steering gear and turntable assembly



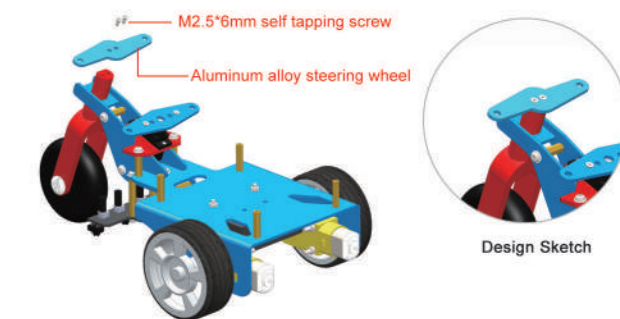
### 12 Metal servo and turntable assembly



### 13 Servo and Car chassis assembly



### 14 Front wheel steering assembly



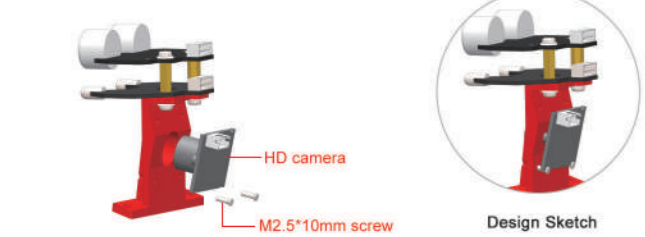
### 15 Ultrasonic module and 7 color searchlight assemble



Design Sketch

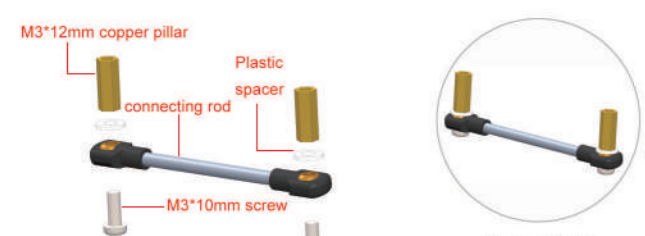
### 16 HD Camera assemble

Note: only Raspberry Pi available



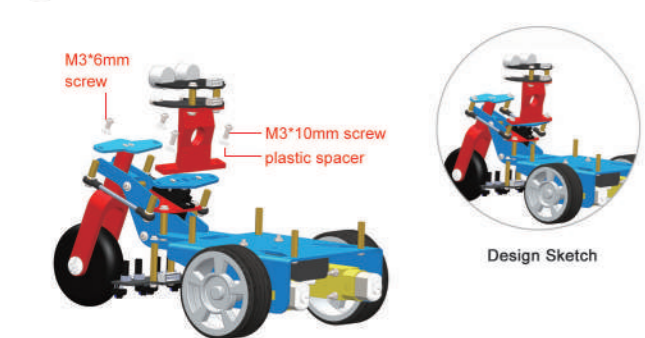
Design Sketch

### 17 Connecting rod



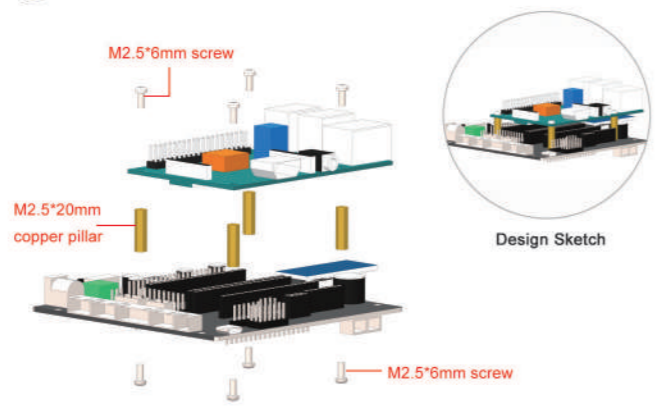
Design Sketch

### 18 Steering engine and 3D stand assemble



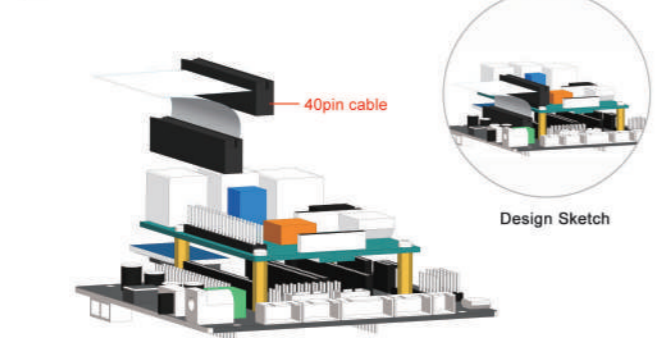
Design Sketch

### 19 Raspberry Pi control board assembly



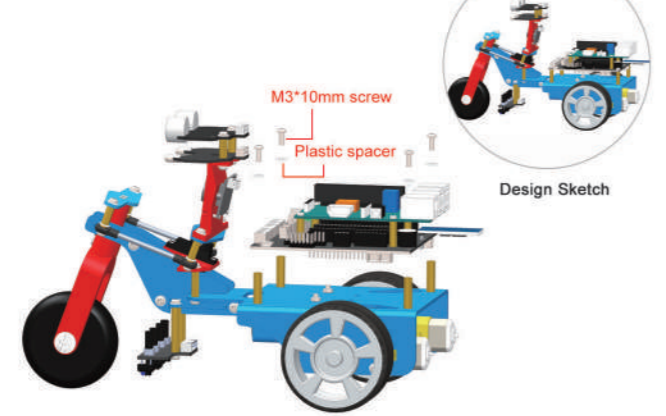
Design Sketch

### 20 40pin cable assembly



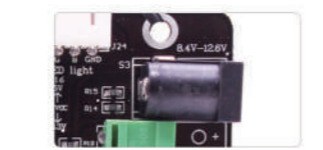
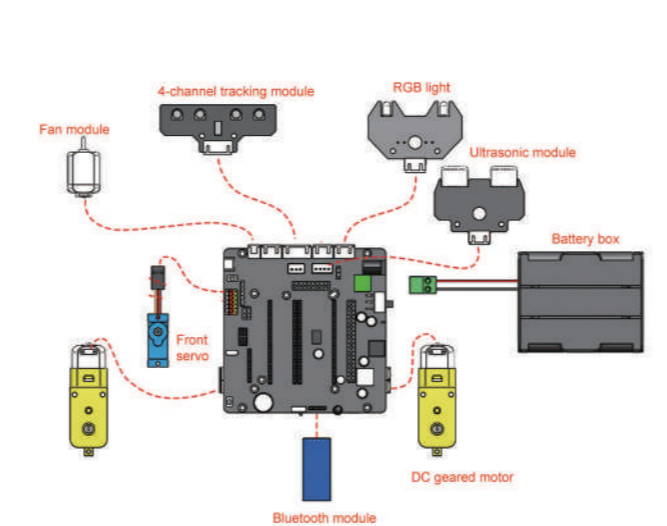
Design Sketch

### 21 Expansion board assembly

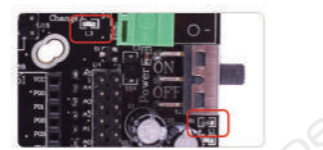


Design Sketch

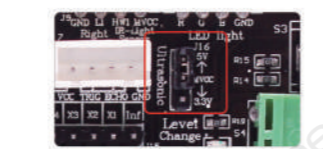
## Introductions for expansion board connection



[8.4V-12.6V] DC charging stand; 18650 lithium battery is used for charging. Note that this DC port is on the expansion board.



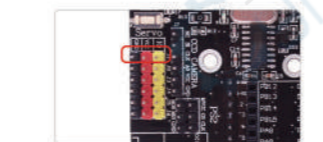
[L3]: The power supply indicator light is always on after the power switch is turned on. If it is not lit, please check the power supply wiring (the power line red corresponds to [+], and the black corresponds to [-]).



Jumper cap shorted (MVCC->5V) (factory default plug in Here.)



Put the switch to (OFF).



The front servo interface is [J1], in which brown is connected to GND, red is connected to VCC, and orange is connected to IO port.

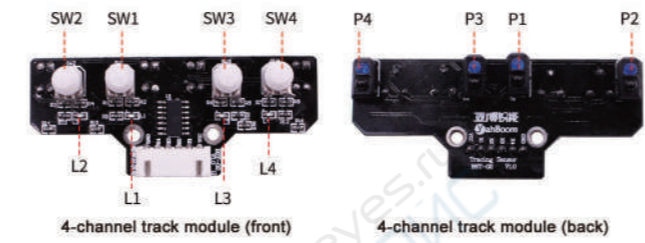
The horizontal servo interface of camera is [J2], in which brown is connected to GND, red is connected to VCC, and orange is connected to IO port.

The vertical servo interface of the camera is [J3], in which brown is connected to GND, red is connected to VCC, and orange is connected to IO port.

## Function debugging

### 1.Tracking mode :

Environmental requirements: indoors, where infrared light is not strong. The black line track width on the white bottom surface needs to be greater than 16mm.



- Debugging:
- Adjust the potentiometer [SW1] so that when the photoelectric sensor [P1] is facing the white bottom surface, the LED light [L1] is off, and when facing the bottom of the black line, the LED light [L1] is on.
  - Adjust the potentiometer [SW2] so that when the photoelectric sensor [P2] is facing the white bottom surface, the LED light [L2] is off, and when facing the bottom of the black line, the LED light [L2] is on.
  - Adjust the potentiometer [SW3] so that when the photoelectric sensor [P3] is facing the white bottom surface, the LED light [L3] is off, and when facing the bottom of the black line, the LED light [L3] is on.
  - Adjust the potentiometer [SW4] so that when the photoelectric sensor [P4] is facing the white bottom surface, the LED light [L4] is off, and when facing the bottom of the black line, the LED light [L4] is on.
- Note: When adjusting the potentiometer, the rotation amplitude should not be too large, and the rotation amplitude is less than 30 degrees.

## Bluetooth remote control

APK Download link:  
<https://drive.google.com/open?id=1UpauWq4T4V7TtYlH6ki6Gn2vPWRz9t5jn>

Please download bluetooth APK with Aroid phone:  
 Turn on the Bluetooth on your mobile phone and open the application [Trikebot].  
 The Bluetooth module near the tail of the Trikebot smart car can be connected automatically.If you find that the search Bluetooth signal changes in the upper left corner, you can directly click CONNECT to connect.



After the connection is successful, enter the main control interface.

## Master interface



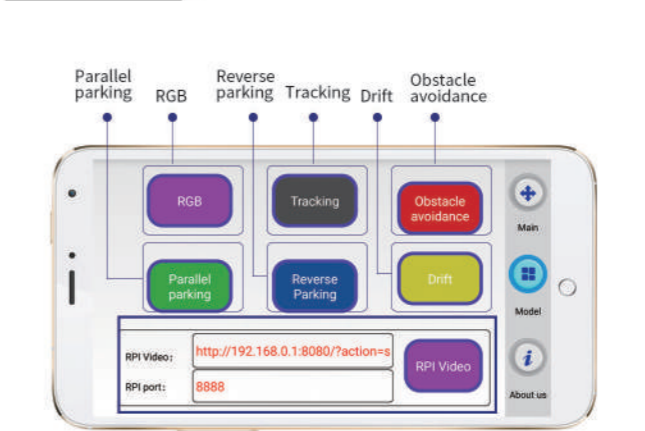
Car calibration:If used, it is found that the position of the steering gear is not facing straight ahead. You can click the car calibration switch. When the display is "on", reinstall the turntable according to [12. Combination of the steering gear and the digital metal servo] to make the ultrasonic module on the turntable face straight ahead.

Car control:First turn off the car calibration switch to the "off" . At this time, the "left ,middle, right "can control the position of the car head, and the slider can control the direction of the car at any angle.

Lights:Click on "Lights ", the options for the various colors of the lights will pop up, click on any color to change the color of the lights.

Left drift/Right drift:Click left or right drift alone can realize the in-situ drift of the car; during the movement of the car, click left and right drift, and the car can drift in motion.

## Mode Choice



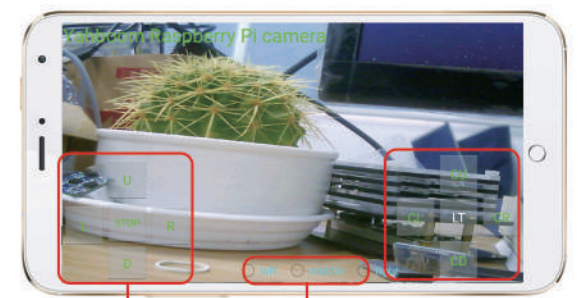
- Mode description:
- Colorful searchlight: click [OK] of the [Colorful searchlight] , the smart car rotating the pan/tilt, searchlight random change color.
  - Tracking mode : Please debug the smart car according to the "Tracking mode" in "Function Debugging" . Place it on the black line after debugging (the two sensor probes in the middle of the four-way patrol module must be on the black line, otherwise the line cannot be patrolled) Click on the "Start" smart car in the "Tracking Mode" to track along the black line track.
  - Obstacle avoidance mode: before operation, place click the [Middle] of the [servo pan/tilt control] in the [master interface] to reset servo, making ultrasonic sensor facing forward. Then, debug the smart car according to the "Obstacle avoidance mode" in the "Function debugging" , click [OK] of the [Obstacle avoidance mode] after debugging, the smart car will automatically drive and avoid the obstacle.
  - Parallel parking: Please put the TrikeBot into the side parking position, click "ON" ,the car will automatically parallel parking, click "OFF" , the car will exit the parallel parking mode to enter the default remote control mode!
  - Reverse parking: Please put the TrikeBot into the starting position of reverse parking, click "ON" , the car will automatically reverse parking, click "OFF" , the car will exit the reverse mode to enter the default remote mode!
  - Drift: Please put the TrikeBot car into the open area first, click "ON" , the car will demonstrate the drift, click "OFF" , the car will exit the drift mode to enter the default remote control mode!

**Operation step:**  
 1. Connect to the Raspberry Pi wifi hotspot with your mobile phone: YahBoom\_Car  
 The initial password is: 12345678

2.Enter the Raspberry Pi ip address: <http://192.168.0.1:8080/?action=snapshot>.

Raspberry Pi port number: 8888,Click [video](#) [Raspberry Pi video](#) (camera version)

The following Raspberry Pi video control interface appears.



Direction control Ultrasonic servo platform control Camera platform control and light

Note: The Raspberry Pi video display interface controls the car, using the Bluetooth transmission control command, and the video stream uses TCP communication. After the configuration, the Raspberry Pi SSH login user name is pi, the login password is yahboom,, the SSH port number is 22, and the root user login password is yahboom.