

17DOF Humanoid Robot -Assembling Instructions Manual

1. Preparation

1. Equipped with installation structure bracket



The names of the structural supports shown from left to right and from top to bottom in the above figure are: UBeam bracket, big foot board, multi-function bracket, longUBracket, shortUBracket, LType bracket, straight bracket, oblique Bracket

Install a complete set17The following accessories are required for the DOF humanoid robot:

- (a) Multifunctional bracket:16individual
- (b) shortUBracket:7individual
- (c) longUBracket:4individual
- (d) incline UBracket:4individual
- (e) LType bracket:4individual

- (f) One-word bracket:4individual
- (g) Padfoot:2individual
- (h) UBeam support:1 individual

2, equipped with installation screws and hardware accessories



The names of the hardware accessories shown from left to right and from top to bottom in the above picture are: round head M4*8 screw (M4Nut), round head M3*10 screw (M3Nut), round head M3*7 screw (M3Nut), Flat Head M3*6 screw (M3Nut), nylon plastic flat head M3*20 screw (M3*6 Plastic studs), round head M3*6 screw, round head M3*5 screws, metal steering wheel, flange bearings

Install17The following hardware screws are required for the DOF humanoid robot:

- (a) Round head M4*8 screw:64individual
- (b) M4Nut:64individual
- (c) Round head M3*10 screw:14individual
- (d) Round head M3*7 screw:92individual
- (e) Round head M3*6 screw:17individual
- (f) Round head M3*5 screw:68individual
- (g) Flat head M3*6 screw:8individual

- (h) M3Nut:114individual
- (i) Nylon plastic flat head M3*20screw:2individual
- (j) M3*6Plastic Studs:4individual
- (k) Metal steering wheel:17individual
- (l) Flange bearings:14individual

3. Equipped with installation tools

The tools required are: needle-nose pliers, cross (slotted) screwdriver, cross (slotted) electric screwdriver, and tweezers.

Needle-nosed pliers: mainly used to clamp nuts, or tighten nuts after installation to make the structure more stable. Cross (slotted) screwdriver: mainly used to install various types of screws.

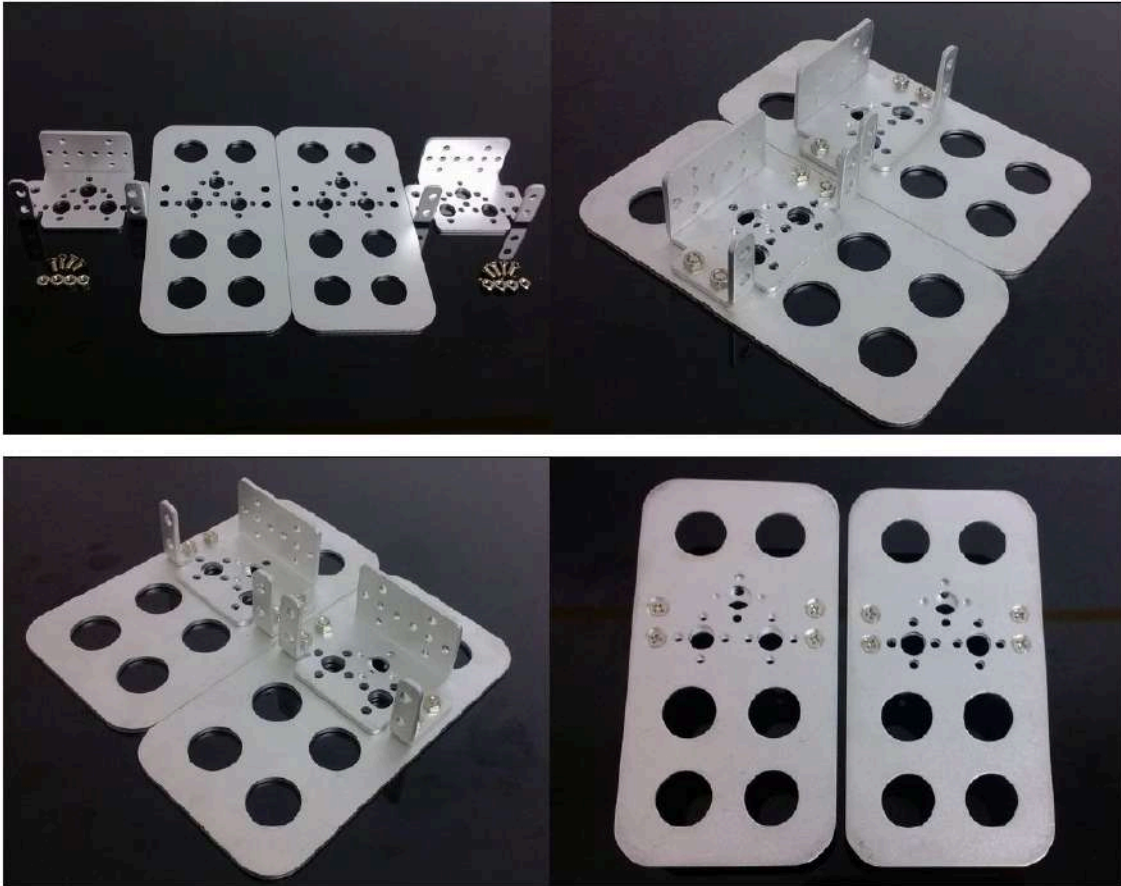
Phillips (flat) electric screwdriver: can quickly tighten or remove screws, speed up installation, and be more professional. Usually, an electric screwdriver is used to quickly tighten the screws, and then needle-nosed pliers are used to manually tighten the screws.

Tweezers: For some structural positions that are difficult to reach with fingers, tweezers can be used to deliver screws and nuts.

2. Install structural parts

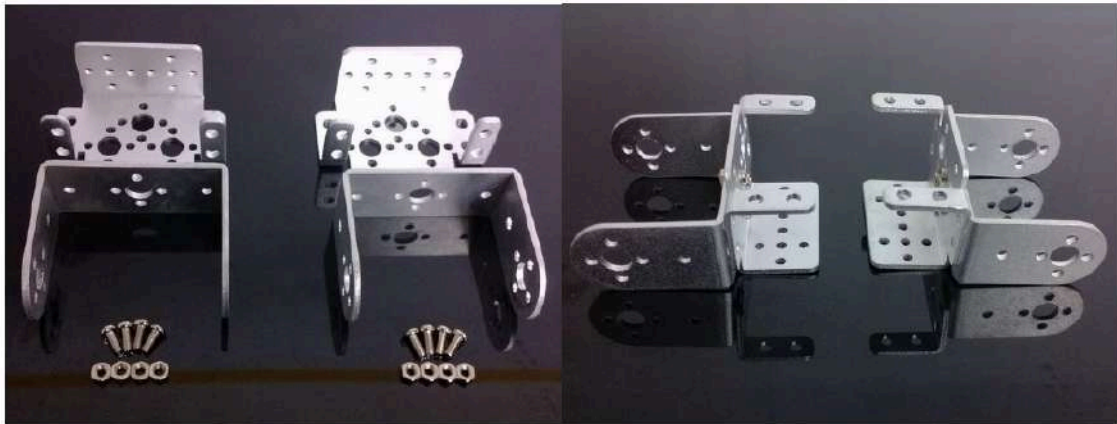
After preparing the above-mentioned structural parts, hardware screw accessories and installation tools, we will move on to the installation phase, starting with installing the support structures of various parts of the robot.

1. Install the robot foot structure



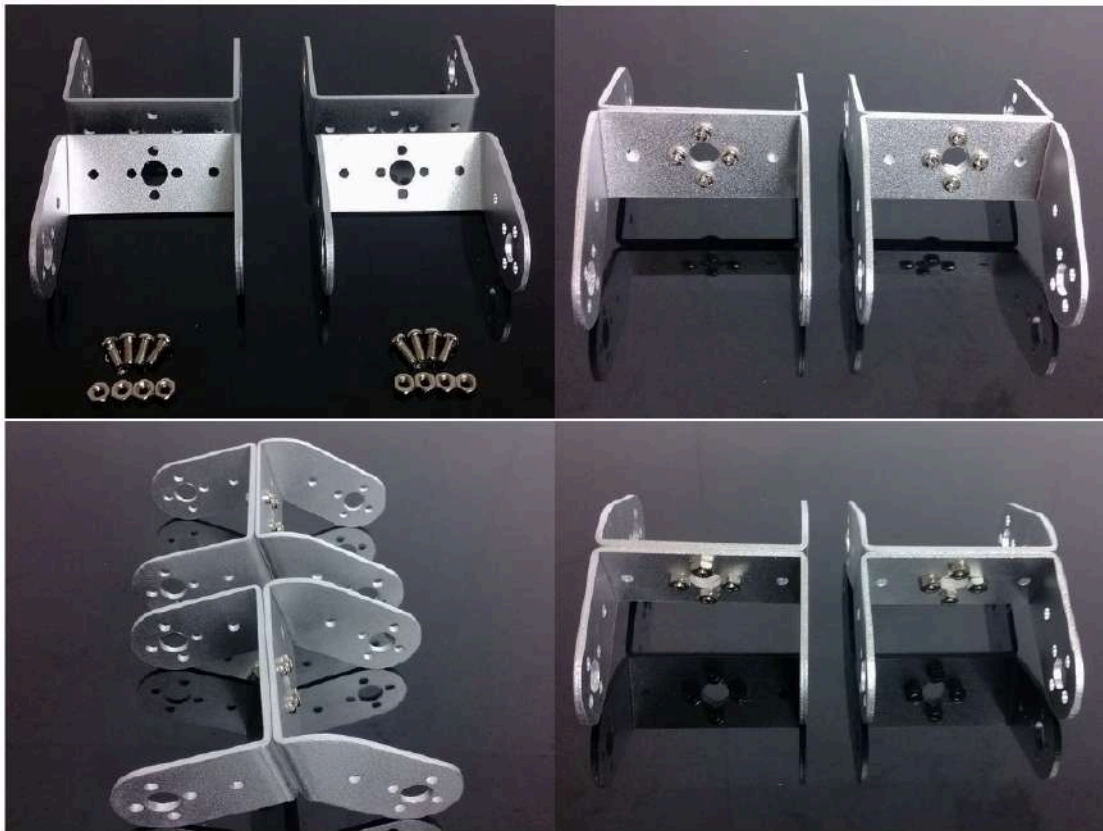
Take the big foot21. Multifunctional bracket2pcs, flat head M3 6screw8individual, M3Nuts8During the installation process, pay attention to the countersunk hole of the big foot plate facing downwards, so that the screw cap can be buried in the countersunk hole to make the bottom smooth. In addition, pay attention to the horizontal placement of the multi-function bracket and align it left and right during installation. Because the hole diameter is slightly larger, there is a certain amount of shaking, so after installing the screws, use needle-nosed pliers to tighten them to achieve a stable structure.

2, Install the robot ankle structure



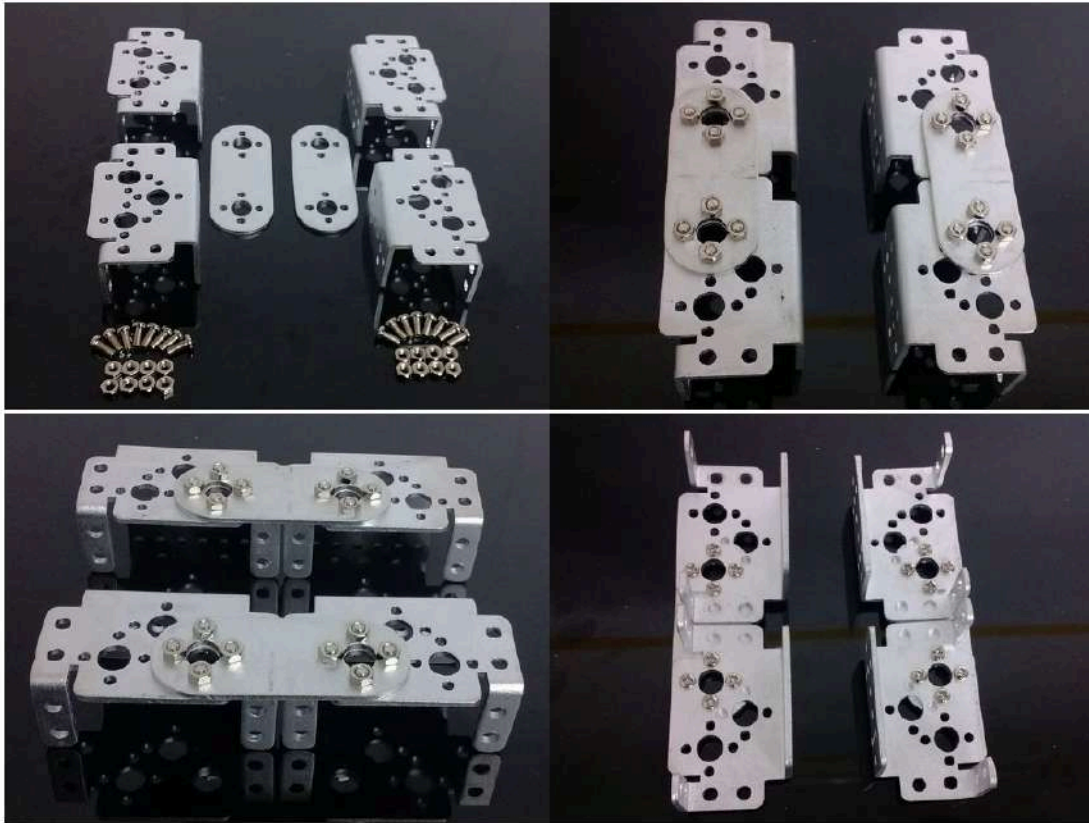
Get the multifunctional bracket 2 pcs, short U Bracket 2 Round head M3*7 screw 8 individual, M3 Nuts 8. During installation, the nut should face upwards and the nut should face downwards. Keep the brackets aligned when connecting, and use needle-nosed pliers to tighten the screws after installation to achieve a stable structure.

3, Install the robot calf structure



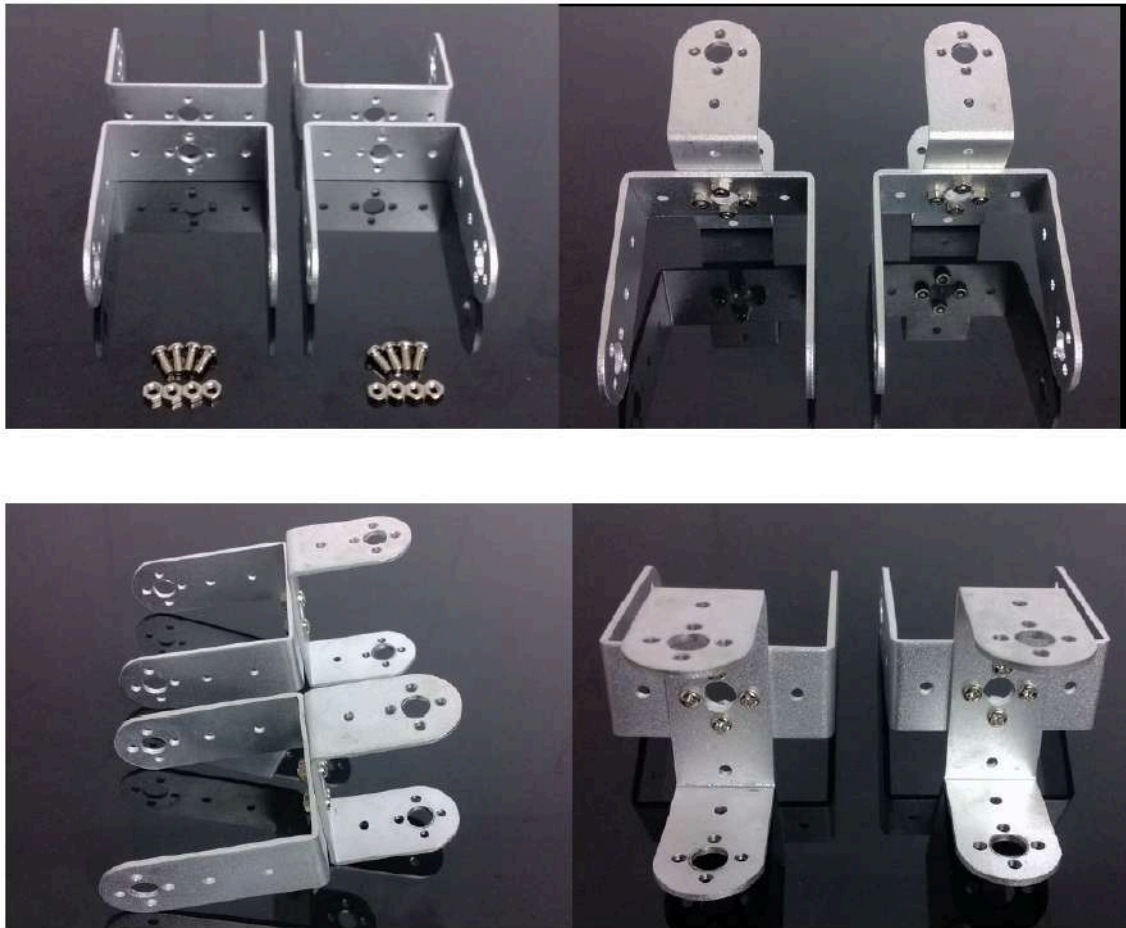
ObliqueUBracket2pcs, shortUBracket2Round headM3*7screw8indivual, M3Nuts8Install as shown in the figure.UOn the nut, shortUUp, pay attention to the slopeUBracket and shortUKeep the brackets aligned when connecting, and use needle-nosed pliers to tighten the screws after installation to achieve a stable structure.

4, Install the robot thigh structure



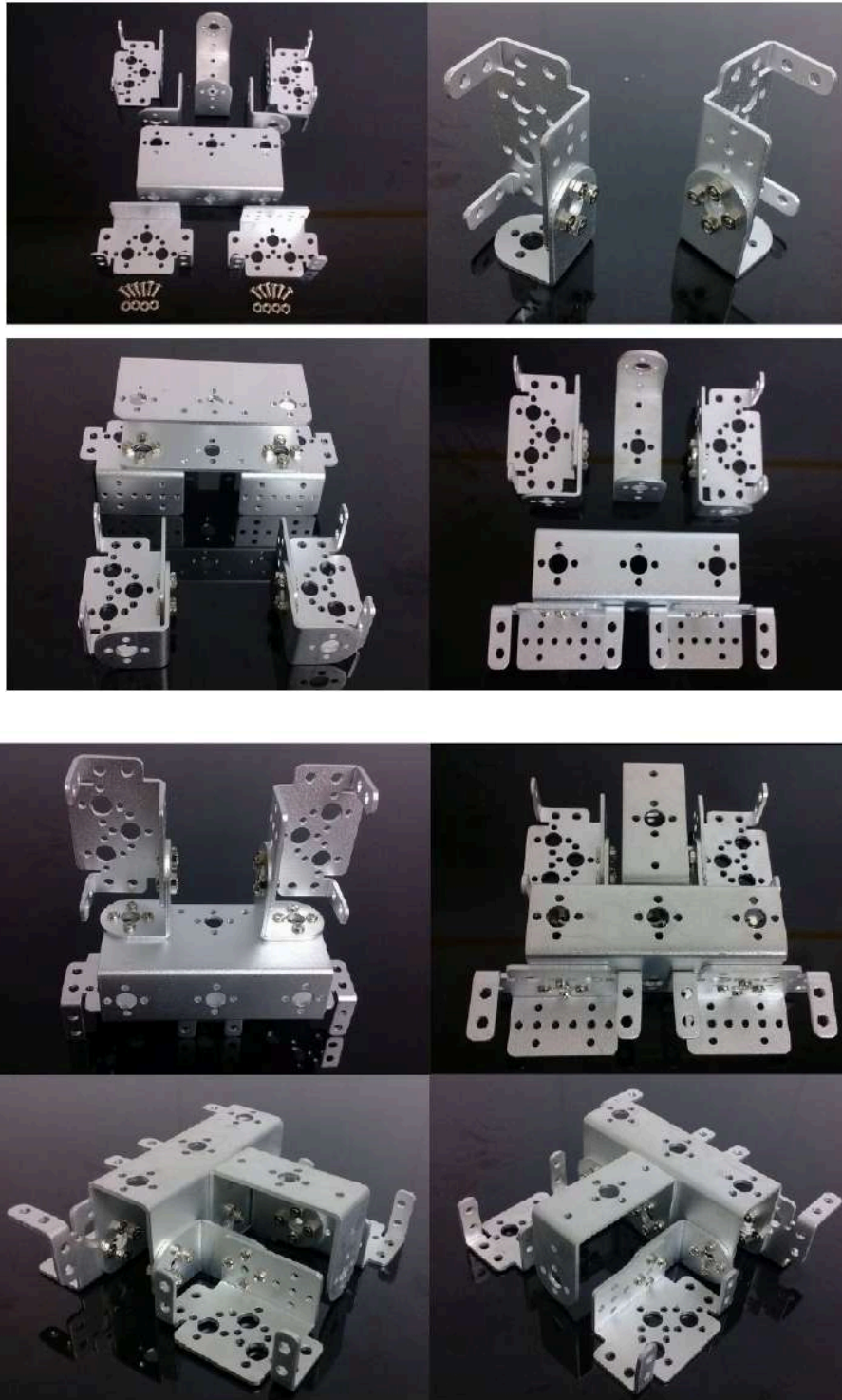
Get the multifunctional bracket41. One-line bracket2Round head M3*7screw16individual, M3Nuts 16During the installation process, the screws are inserted from the inside of the multi-functional bracket and the nuts are tightened from the outside. Note that the two multi-functional brackets are connected by a straight-shaped connecting piece to keep them vertically aligned. After the screws are installed, they need to be tightened with needle-nosed pliers to achieve a stable structure.

5. Install the robot cross-section structure



Take Advantage UBracket2pcs, shortUBracket2Round headM3 7screw8individual, M3Nuts8Install as shown in the figure.UPass through the bracket and the nutUBracket top fastening, shortUBracket and lengthU The brackets are installed vertically in a cross shape. After installation, the screws need to be tightened with needle-nosed pliers to achieve a stable structure.

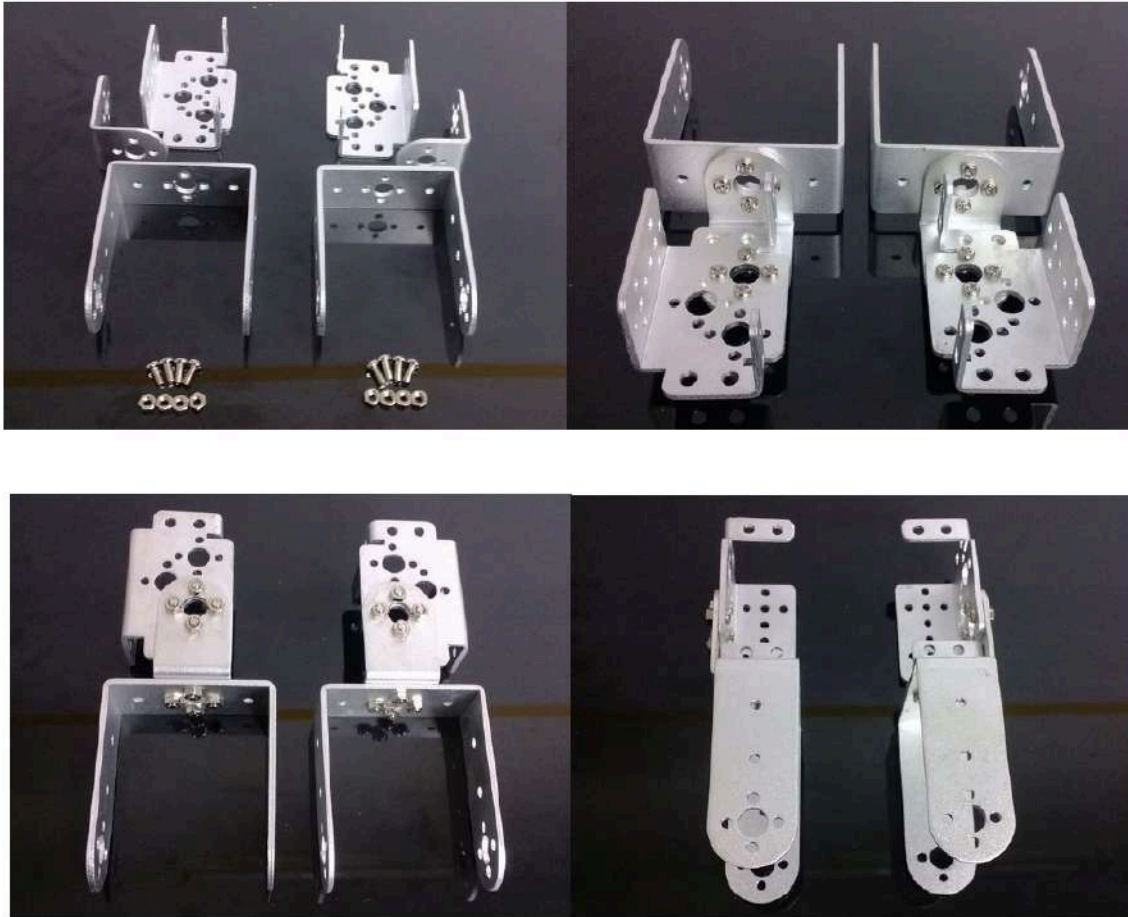
6, Install the robot torso structure



Get the multifunctional bracket 4 pcs, short IJ Bracket 1 individual, UBeam bracket 1 individual, LType Bracket 2, Round head M3*7 screw 28 individual, M3 Nuts 28. The robot body is mainly

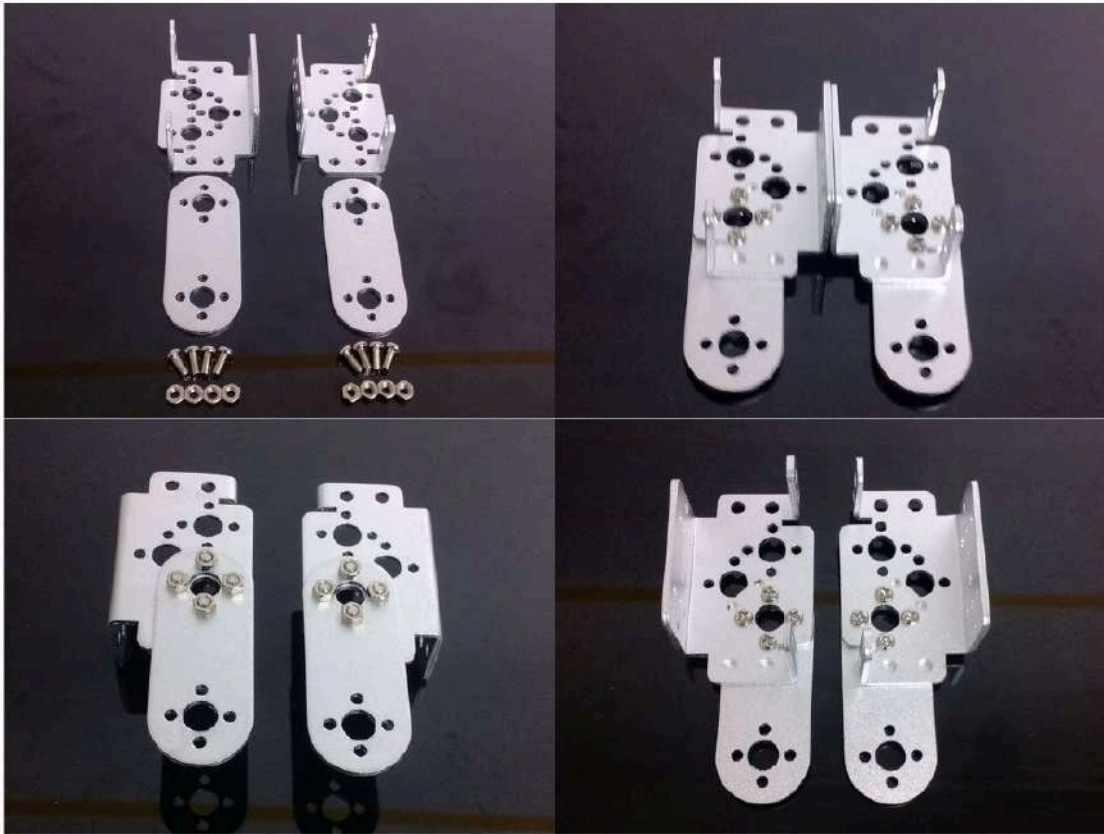
composed of shoulders, hips and neck brackets. During the installation process, the screws are fixed from the inside to the outside, so as not to affect the installation of the servo and facilitate the fixation with needle-nosed pliers. After the screws are installed, they need to be tightened with needle-nosed pliers to achieve a stable structure. At the end of all installation and fixation, it is necessary to confirm that the position of the bracket is fixed in the right direction and not tilted.

7. Install the robot arm structure



Get the multifunctional bracket2LengthUBracketZindivual, LType Bracket2Round head M3*7screw16indivual, M3Nuts 16During the installation process, the screws are fixed from the inside to the outside, so as not to affect the installation of the servo and facilitate the fixation of the pliers. After the screws are installed, they need to be tightened with pliers to achieve a stable structure. At the end of all installation and fixation, it is necessary to confirm that the position of the bracket is fixed in the right direction and not tilted.

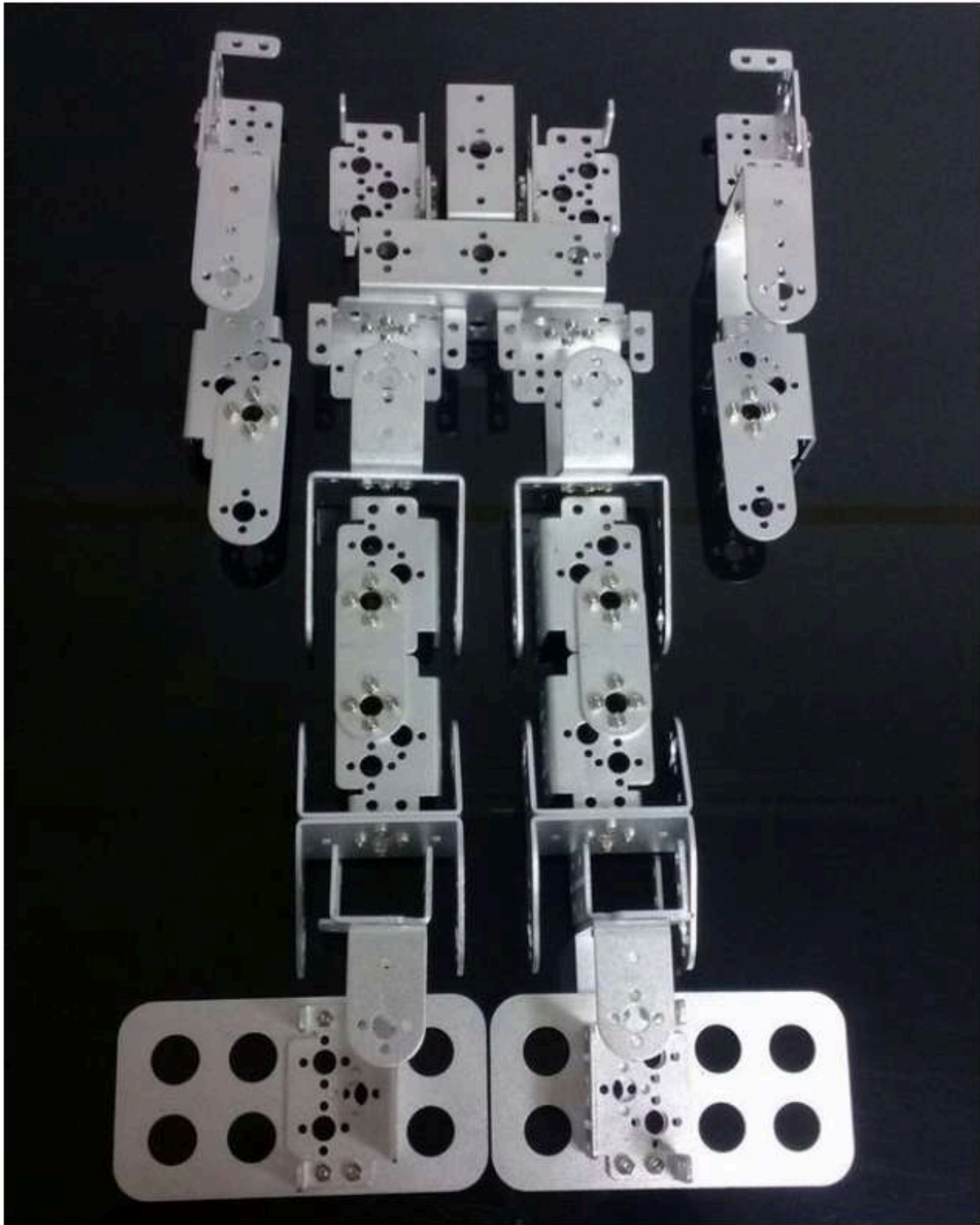
8, Install the robot wrist structure



Multifunctional bracket21. One-line bracket2Round headM3*7screw individual, M3Nuts8During the installation process, the screws are inserted from the inside of the multi-function bracket, and the nuts are tightened on the top of the flat bracket. After the screws are installed, they need to be tightened with needle-nosed pliers to achieve a stable structure.

3. Install the robot joints - servos

After step 2, we have completed the installation of the robot's entire structure. Now let's review all the installed structural parts. First, arrange them in the form of the human body structure, as shown in the figure below; then, start installing the joints of each part.



All servos are adjusted to the middle position by default when leaving the factory (i.e. the maximum left and right range of the servo). Before installing the servo, it is best not to rotate the servo. If the servo is rotated accidentally, you need to use the host computer software to adjust it to the middle position, or use the servo tester to adjust it to the middle

position. The middle position value of the servo is 1500 The following is a diagram of the installation process using a digital servo as an example.

1, Install the robot foot servo



Take the installed robot left and right foot structures
1 Servo motor
2 Round head M3*10 screw 2 pcs, round head M4*8 screw individual, M4 Nuts 4
First, as shown in the figure, M3*10 The screw is installed from the inside of the multi-function bracket to the outside. This screw is used to install the flange bearing at the back, so the screw position must be installed before installing the servo. Note: M3*10 The screw must be installed in the middle hole on the inner side of the multi-function bracket, keeping it on the same horizontal line as the extended bearing of the servo. M4*8 Screws and M4 The nuts fix the servos
4 On the corners and the multi-function bracket, install the screws and tighten them with needle-nosed pliers to achieve a stable structure.

2, Install the robot ankle servo



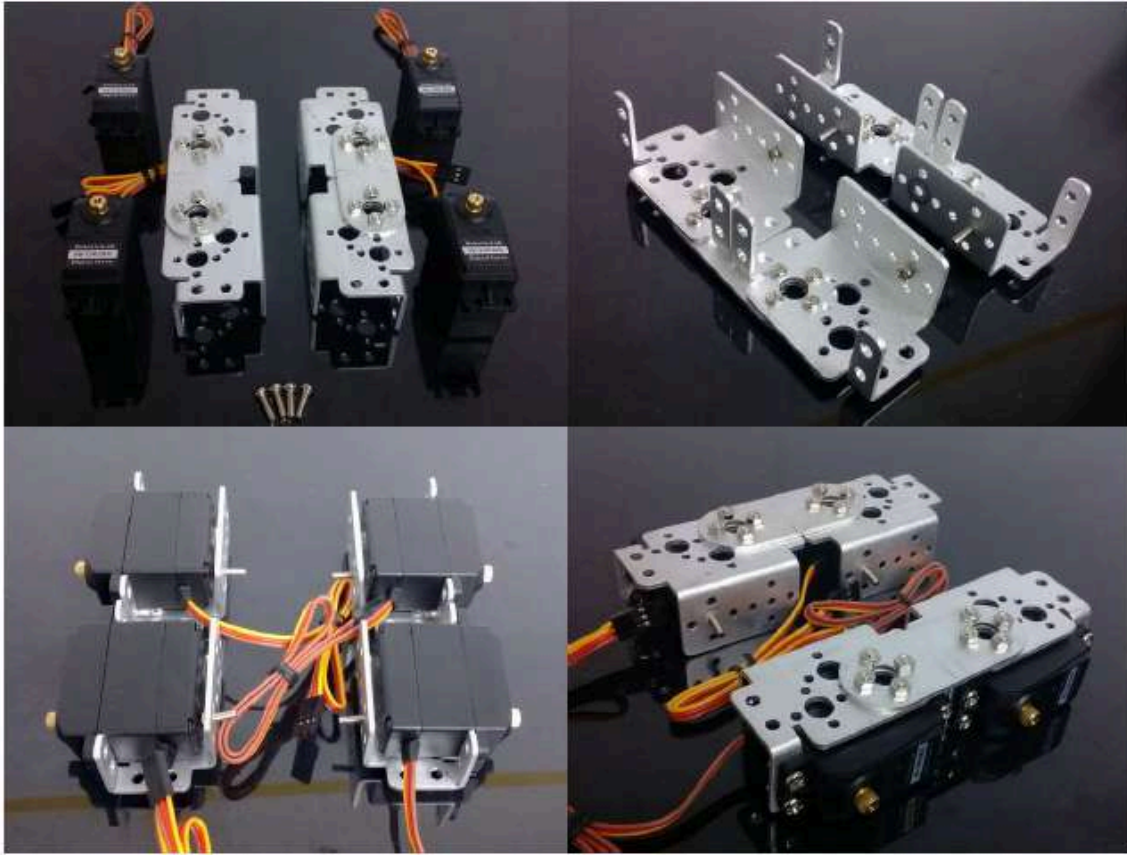
Take the installed robot's left and right ankle structures

- 1 Servo motor
- 2 Round head M3*10 screw 2 pcs, round head M4*8 screw 8 individual, M4 Nuts 4

First, as shown in the figure, M3*10 The screw is installed from the inside of the multi-function bracket to the outside. This screw is used to install the flange bearing at the back, so the screw position must be installed before installing the servo. Note: M3*10 The screw must be installed in the middle hole on the inner side of the multi-function bracket, keeping it on the same horizontal line as the extended bearing of the servo. M4*8 Screws and M4 The nuts fix the servos

4 On the corners and the multi-function bracket, install the screws and tighten them with needle-nosed pliers to achieve a stable structure.

3, Install the robot leg servos



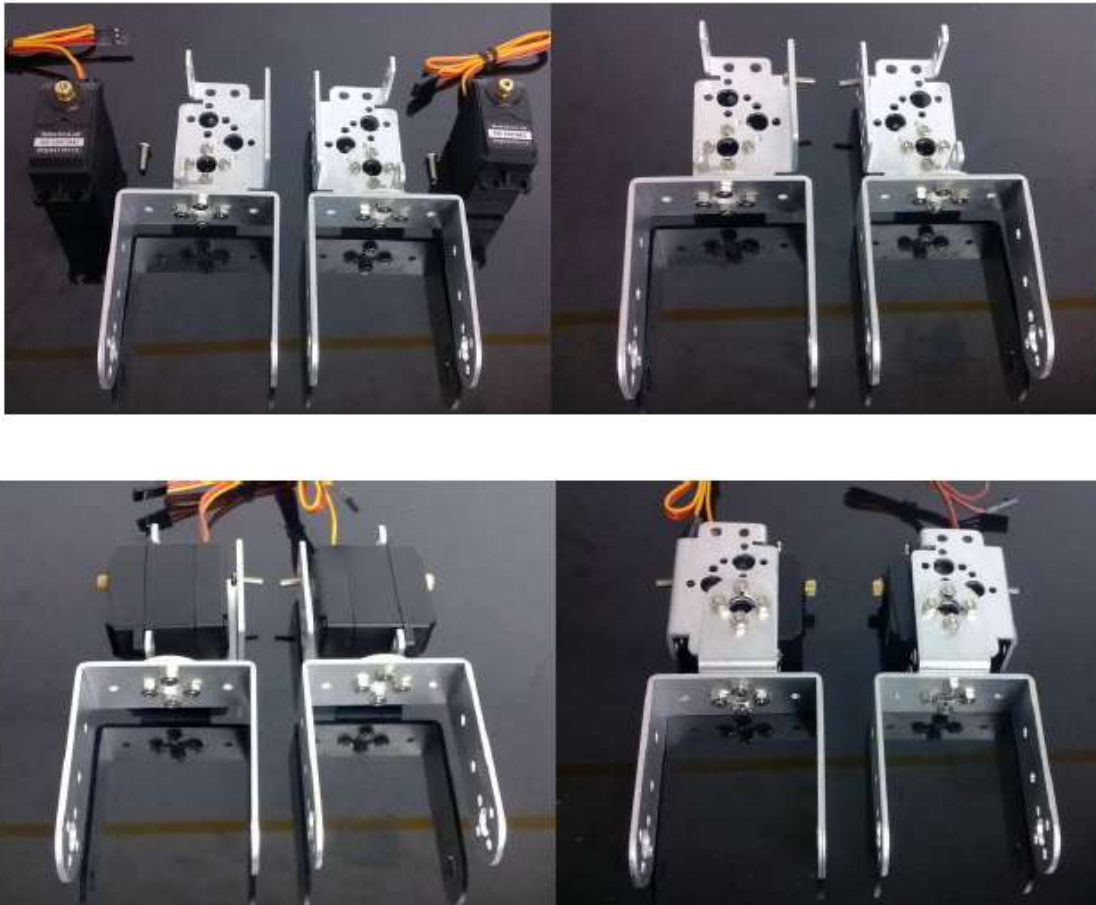
Take the installed robot's left and right thigh structures
1 Servo motor
4 Round head M3*10 screw
4 pcs, round head M4*8 screw
16 individual, M4 Nuts
16 First, as shown in the figure, M3*10 The screw is installed from the inside of the multi-function bracket to the outside. This screw is used to install the flange bearing at the back, so the screw position must be installed before installing the servo. Note: M3*10 The screw must be installed in the middle hole on the inner side of the multi-function bracket, keeping it on the same horizontal line as the extended bearing of the servo. M4*8 Screws and M4 The nuts fix the servos
4 On the corners and the multi-function bracket, Install the screws and tighten them with needle-nosed pliers to achieve a stable structure.

4, Install the robot trunk servo



Take the installed robot torso structure1 Servo motor4Round head M3*10screw2pcs, round head M4*8 screw16individual, M4Nuts161, nylon plastic flat headM3*20screw2pcs, plasticM3*6Studs2First, as shown in the figure, M3*10The screws are installed from the inside of the multifunctional bracket to the outside. The screws are used to install the flange bearings at the back. The plastic screws are installed as shown in the figure above and are used to install the controller. Therefore, the screws must be installed in the correct position before installing the servo. Note: M3*10The screw must be installed in the middle hole on the inner side of the multi-function bracket, keeping it on the same horizontal line as the extended bearing of the servo.M4*8Screws and M4The nuts fix the servos4on the corners and the multi-function bracket, install the screws and tighten them with needle-nosed pliers to achieve a stable structure.

5, Install the robot arm servo



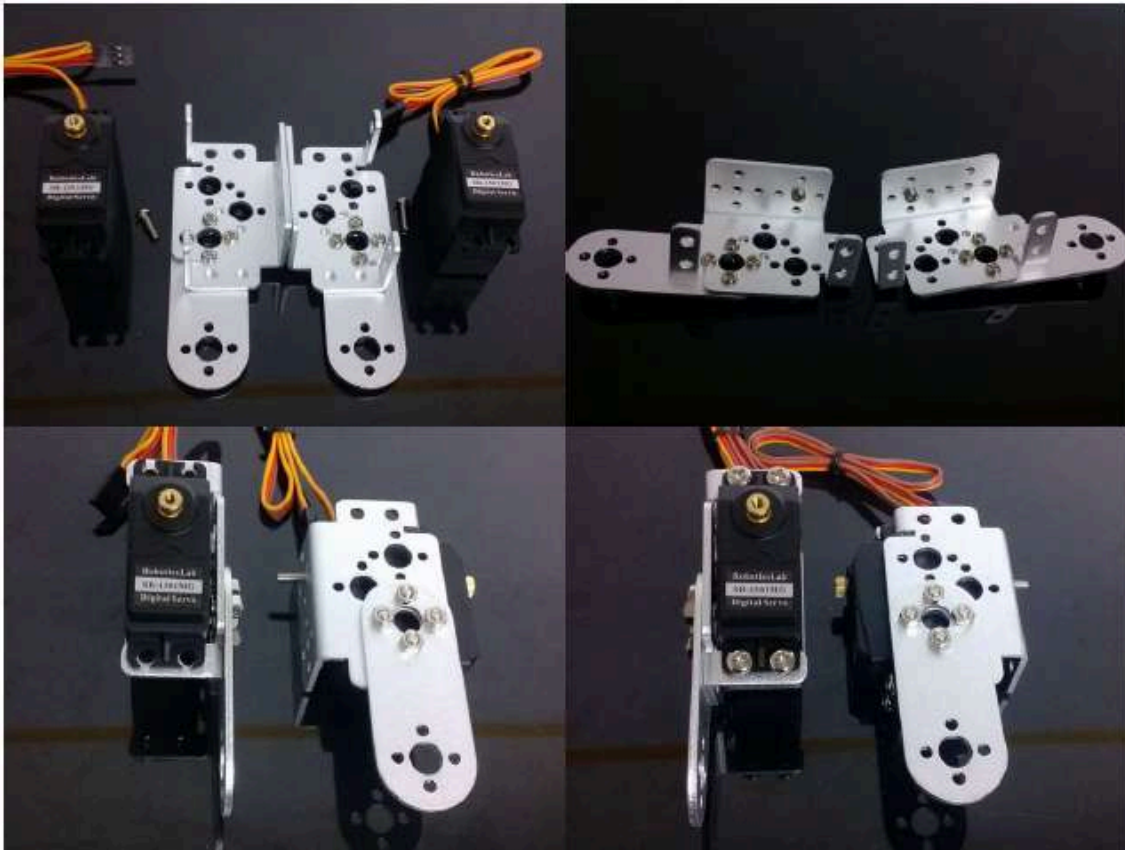
Take the installed robot left and right arm structures

- 1 Servo motor
- 2 Round head M3*10 screw 2 pcs, round head M4*8 screw individual, M4 Nuts 8

First, as shown in the figure, M3*10 The screw is installed from the inside of the multi-function bracket to the outside. This screw is used to install the flange bearing at the back, so the screw position must be installed before installing the servo. Note: M3*10 The screw must be installed in the middle hole on the inner side of the multi-function bracket, keeping it on the same horizontal line as the extended bearing of the servo. M4*8 Screws and M4 The nuts fix the servos

- 4 On the corners and the multi-function bracket, install the screws and tighten them with needle-nosed pliers to achieve a stable structure.

6, Install the robot wrist servo

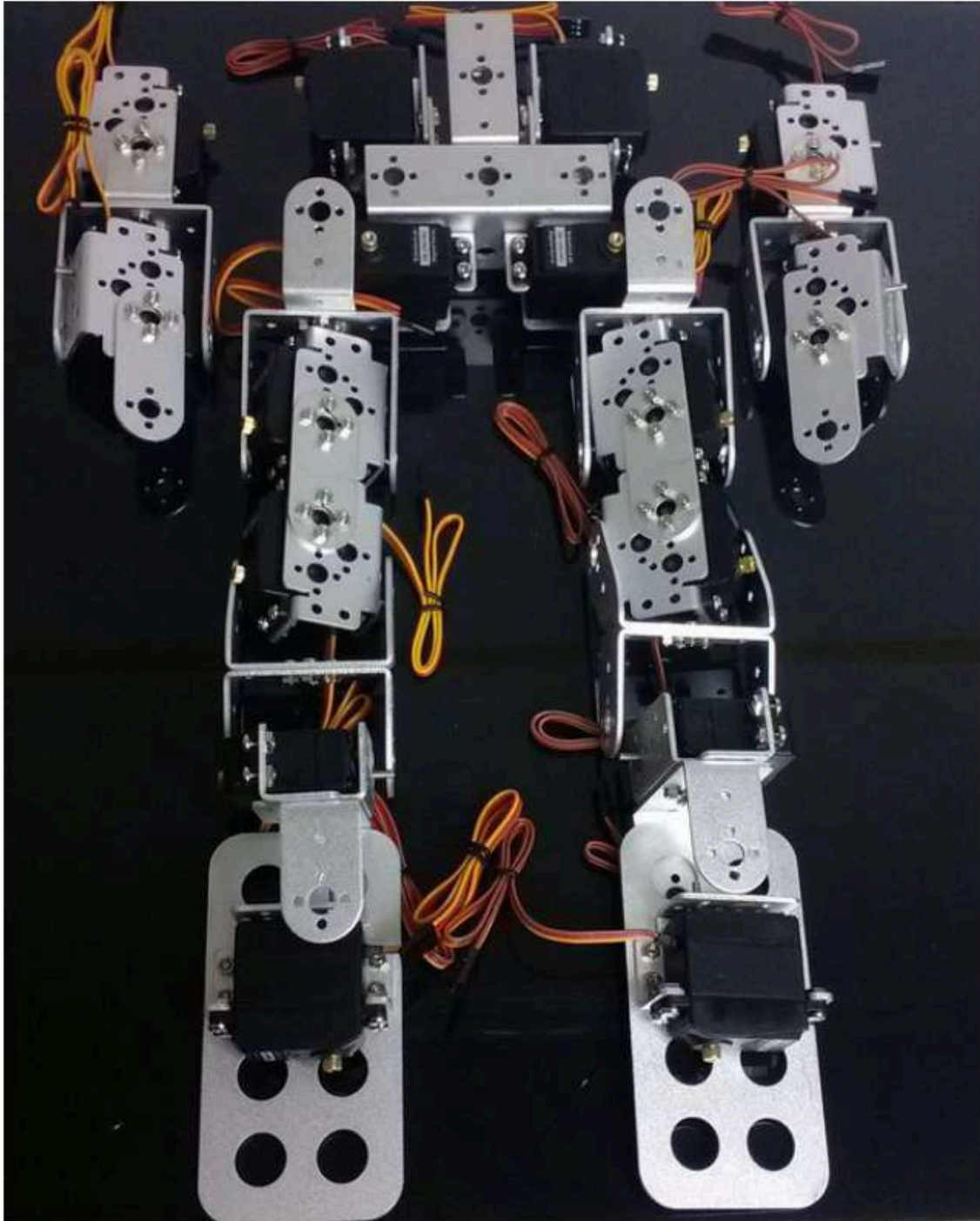


Take the installed robot left and right wrist structures 1 Servo motor 2 Round head M3*10 screw 2 pcs, round head M4*8 screw 8 individual, M4 Nuts 8 First, as shown in the figure, M3*10 The screw is installed from the inside of the multi-function bracket to the outside. This screw is used to install the flange bearing at the back, so the screw position must be installed before installing the servo. Note: M3*10 The screw must be installed in the middle hole on the inner side of the multi-function bracket, keeping it on the same horizontal line as the extended bearing of the servo. M4*8 Screws and M4 The nuts fix the servos 4 On the corners and the multi-function bracket, install the screws and tighten them with needle-nosed pliers to achieve a stable structure.

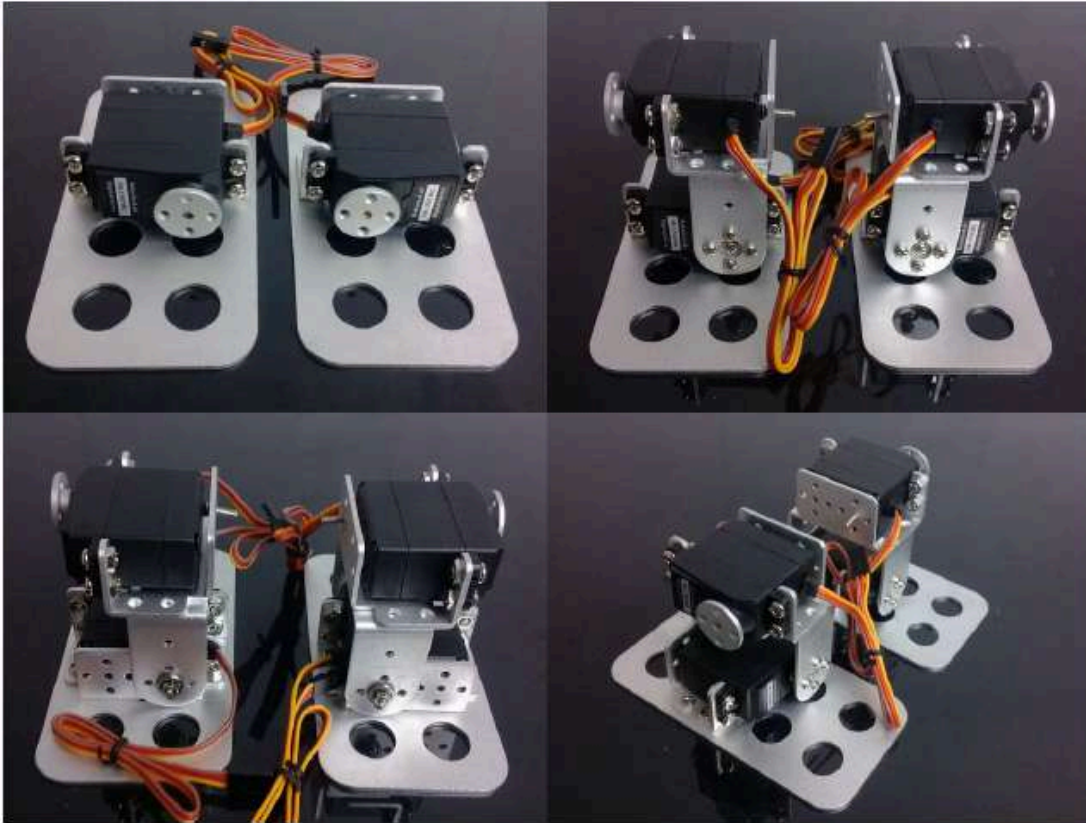
4. Connect the robot parts

After the previous steps, all parts of the robot have been installed. The remaining work is how to connect the various parts to assemble a complete body. As shown in the figure below, first roughly arrange the various parts of the robot so that you can understand the overall location of each part and avoid misplacing them when connecting. It should be noted that although the left and right symmetrical parts of the robot look the same, they are actually different (because the installation screws are in different positions), so they cannot be used

interchangeably during installation. The structure on the left cannot be used for installation on the right. Remember!

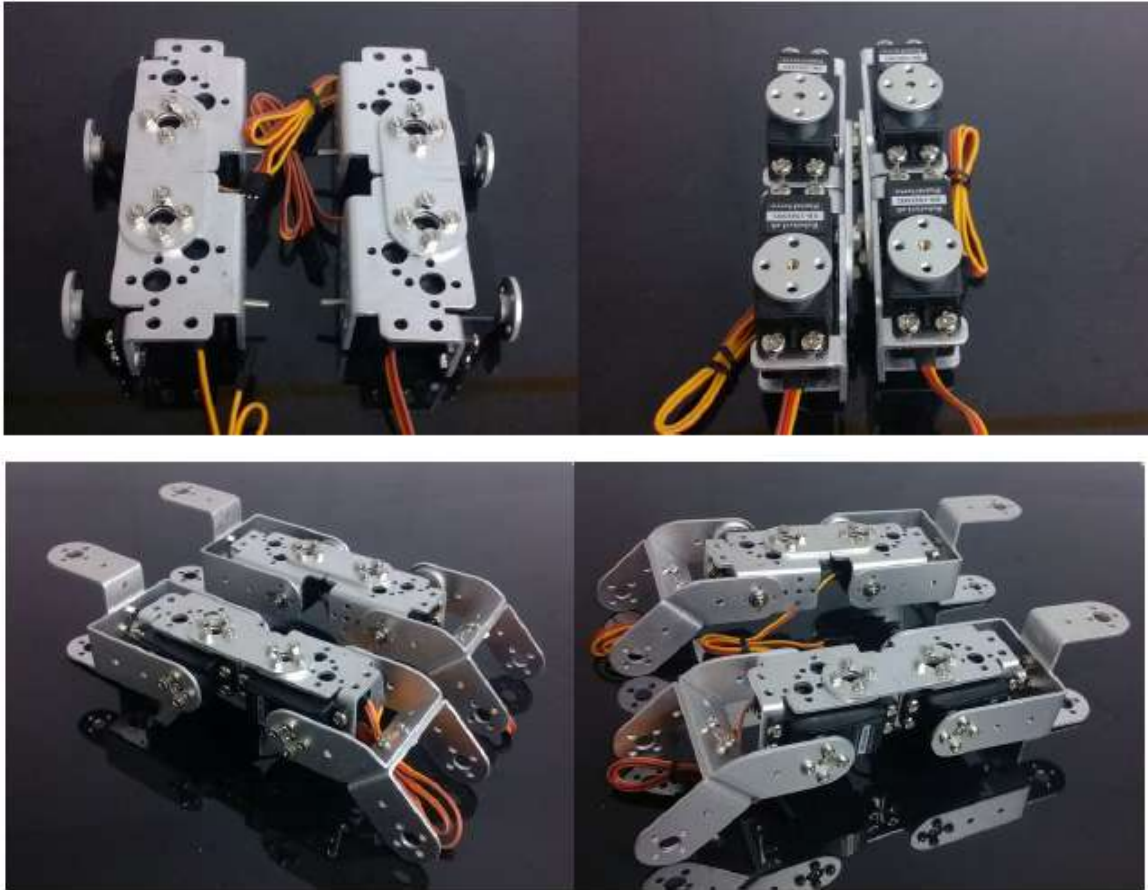


1, connect the robot's feet and ankles



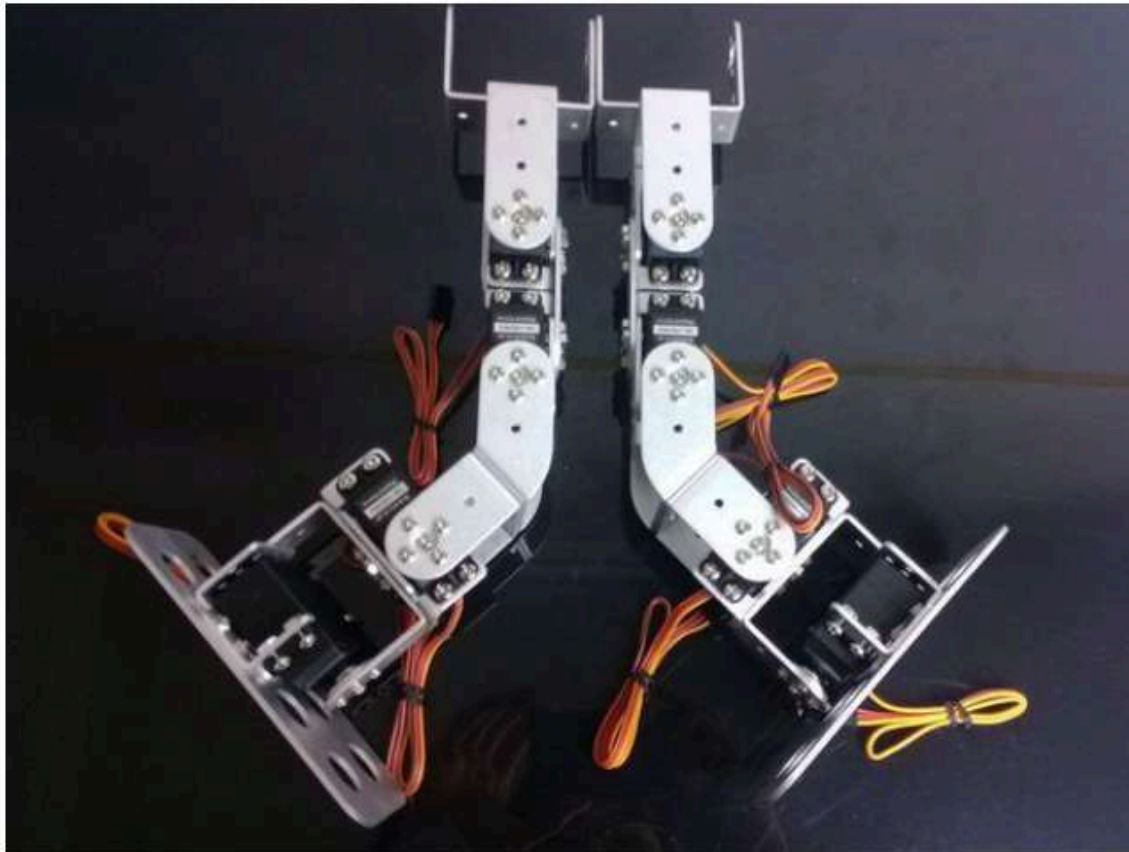
Take the installed robot foot and ankle structures
1. Metal steering wheel
4 Round head M3*5 screw
8 Round head M3*6 screw
2 individual, M3 Nuts
2 1. Flange bearings
2 First, install the metal steering wheel vertically on the servo (Note: The default angle of the servo is the middle value when it is shipped. If you accidentally rotate the servo, the current servo output angle is unknown, and you need to use the software to adjust it to the middle value.
1500 When installing the metal steering wheel, make sure that the four holes of the steering wheel are horizontal and vertical, and do not install it crookedly); then, put the two structures together, and use 4 Round head M3*5 Screw fixing, middle hole for 1 Round head M3*6 Fix with screws. Install a flange bearing on the virtual axis on the back, and then use M3 Tighten the nut to secure it. After installing the screws, use needle-nosed pliers to tighten them to achieve a stable structure.

2, connect the robot's calf and thigh



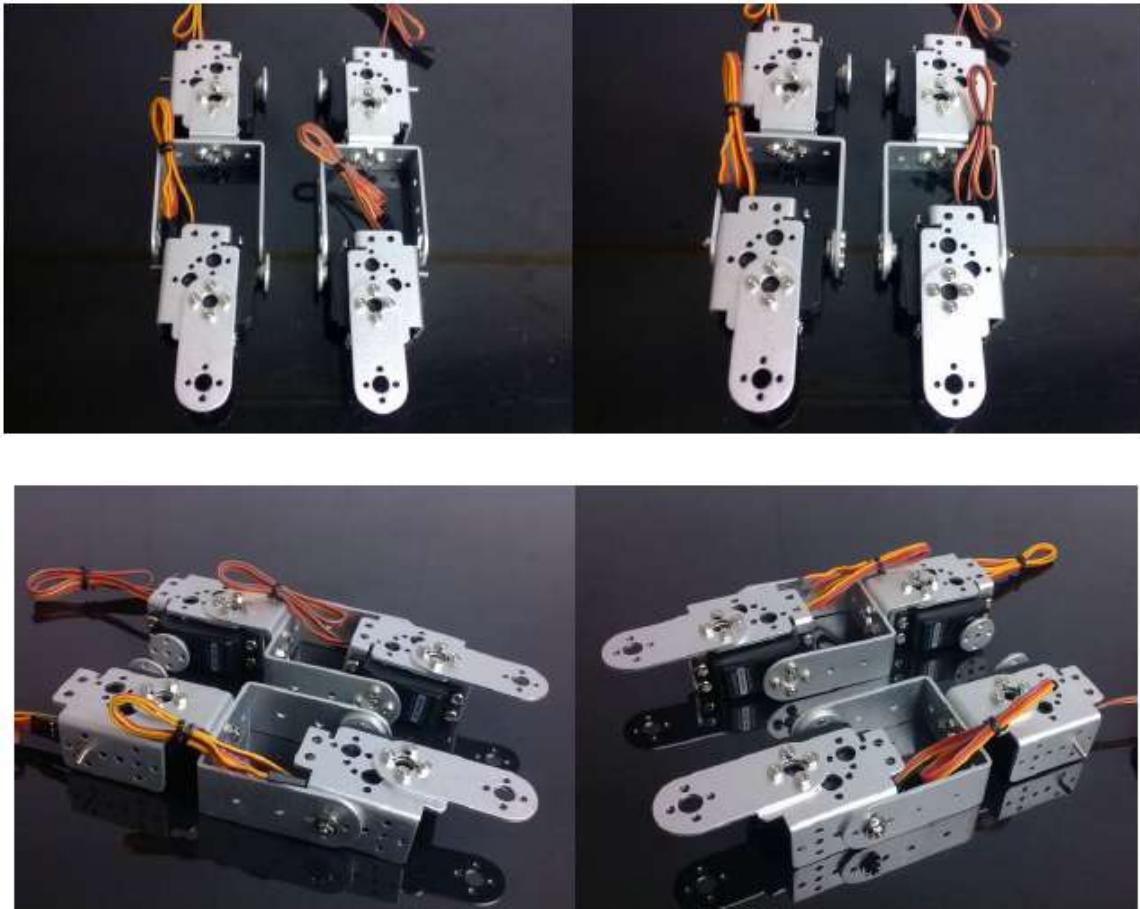
Take the installed robot thigh structure, calf structure and hip joints. 1. Metal steering wheel 4. Round head M3*5 screw 16. Round head M3*6 screw 4 individual, M3 Nuts 4. 1. Flange bearings 4. First, install the metal steering wheel vertically on the servo (Note: The default angle of the servo is the middle value when it is shipped. If you accidentally rotate the servo, the current servo output angle is unknown, and you need to use the software to adjust it to the middle value. 1500). When installing the metal steering wheel, make sure that the four holes of the steering wheel are horizontal and vertical, and do not install it crookedly); then, put the two structures together, and use 4 Round head M3*5 Screw fixing, middle hole for 1 Round head M3*6 Fix with screws. Install a flange bearing on the virtual axis on the back, and then use M3 Tighten the nut to secure it. After installing the screws, use needle-nosed pliers to tighten them to achieve a stable structure.

3, connect the robot legs



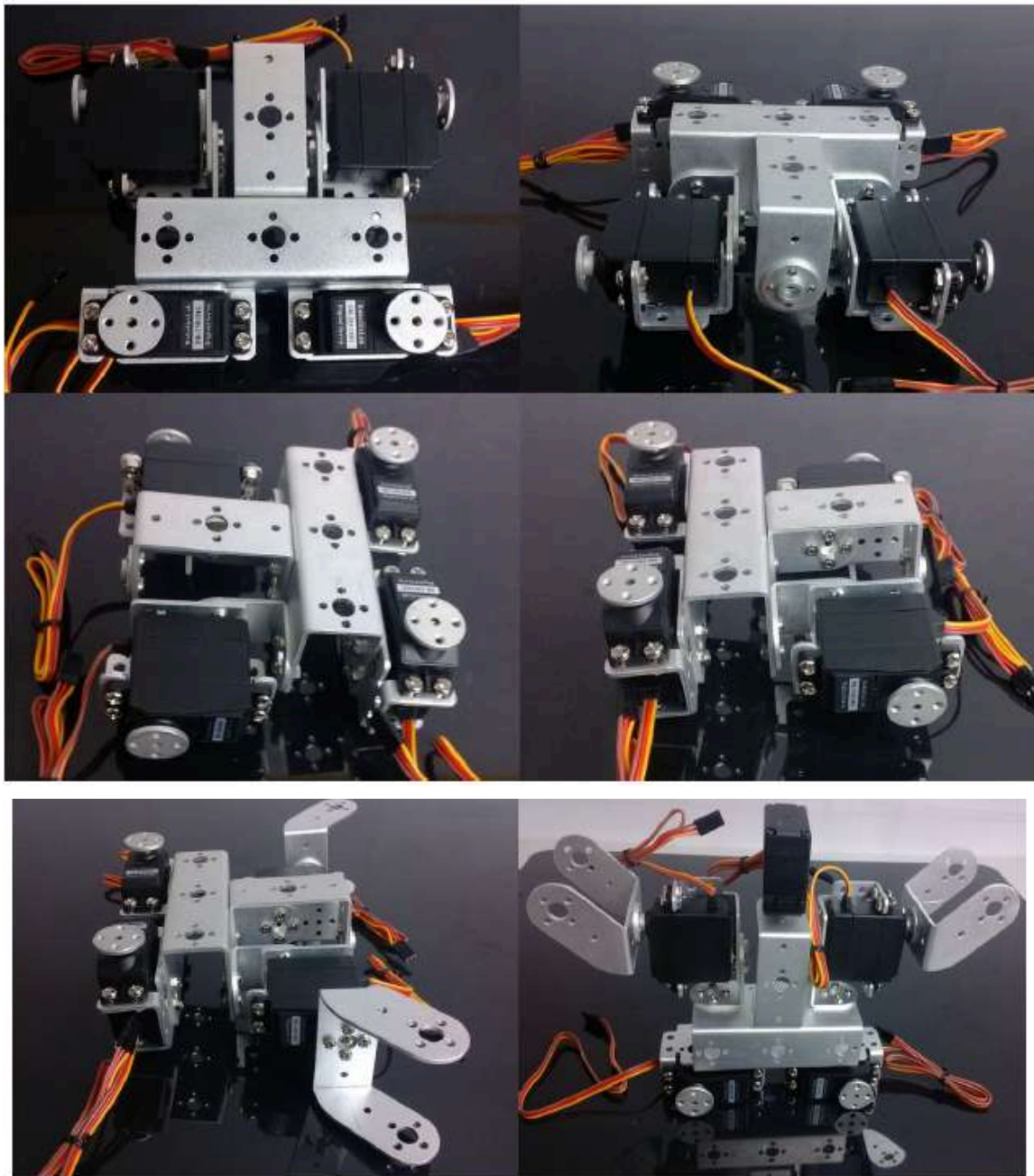
Take the robot lower body mechanism and round head installed in the previous two steps
M3*5screw Round head M3*6screw2 Individual, M3 Nuts21. Flange bearings2Install as
shown in the figure. Put the two installed structures together and use4Round headM3*5
Screw fixing, middle hole for 1 Round head M3*6Fix with screws. Install a flange bearing on
the virtual axis on the back, and then use M3 Tighten the nut to secure it. After installing the
screws, use needle-nosed pliers to tighten them to achieve a stable structure.

4, connect the robot arm



Take the installed robot arm structure and wrist structure. 11. Metal steering wheel. 4 Round head M3*5 screw 8 pcs, round head M3*6 screw 2 individual, M3 Nuts 2. 1. Flange bearings 2. First, install the metal steering wheel vertically on the servo (Note: The default angle of the servo is the middle value when it is shipped. If you accidentally rotate the servo, the current servo output angle is unknown, and you need to use the software to adjust it to the middle value. 1500). When installing the metal steering wheel, make sure that the four holes of the steering wheel are horizontal and vertical, and do not install it crookedly); then, put the two structures together, and use 4 Round head M3*5 Screw fixing, middle hole for 1 Round head M3*6 Fix with screws. Install a flange bearing on the virtual axis on the back, and then use M3 Tighten the nut to secure it. After installing the screws, use needle-nosed pliers to tighten them to achieve a stable structure.

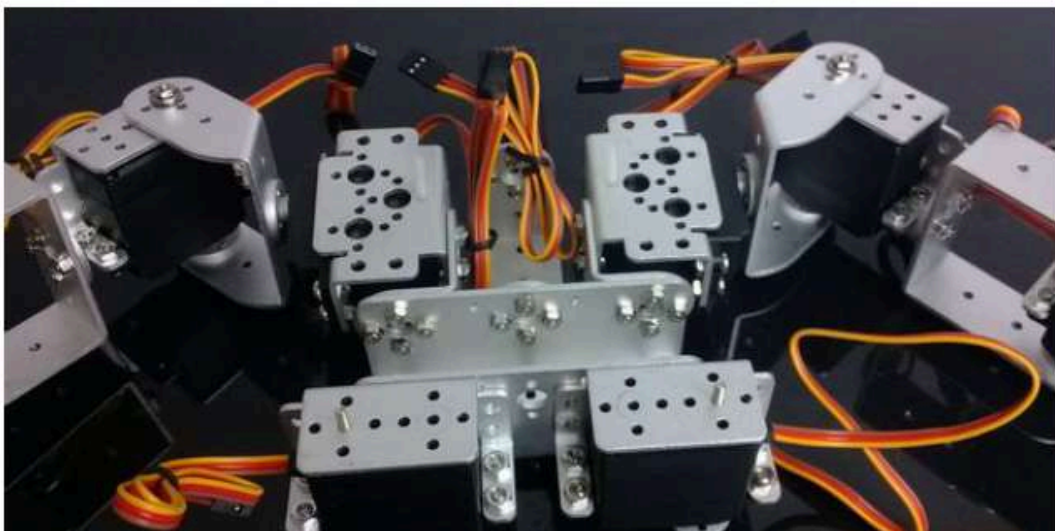
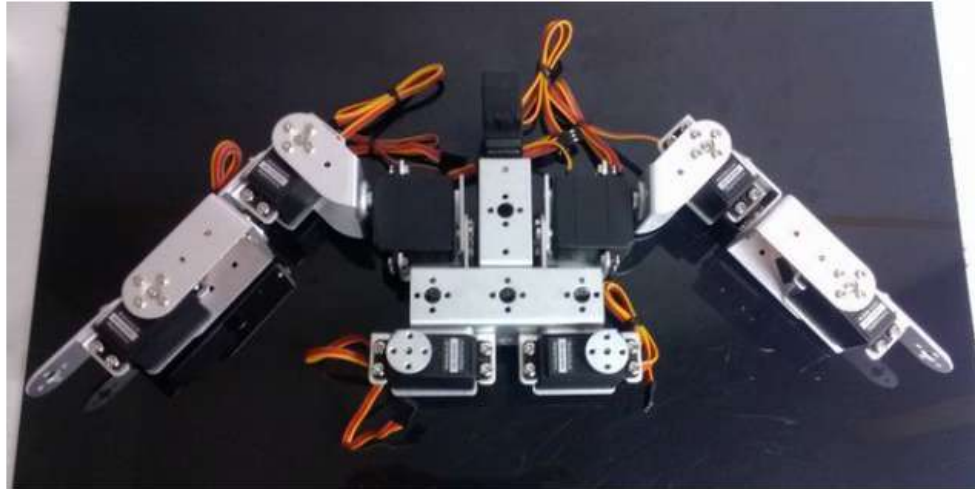
5, connect the robot shoulders and head



Take the installed robot torso1, obliqueU Bracket2Steering gear11. Metal steering wheel5Round head M3*5screw12Round head M3*6screw3 First, install the metal steering wheel vertically on the servo (Note: The default angle of the servo is the middle value when it is shipped. If you accidentally rotate the servo, the current servo output angle is unknown, and you need to use the software to adjust it to the middle value. 1500When installing the metal steering wheel, make sure that the four holes of the steering wheel are horizontal and vertical, and do not install it crookedly); secondly, 1The reverse side of a metal steering

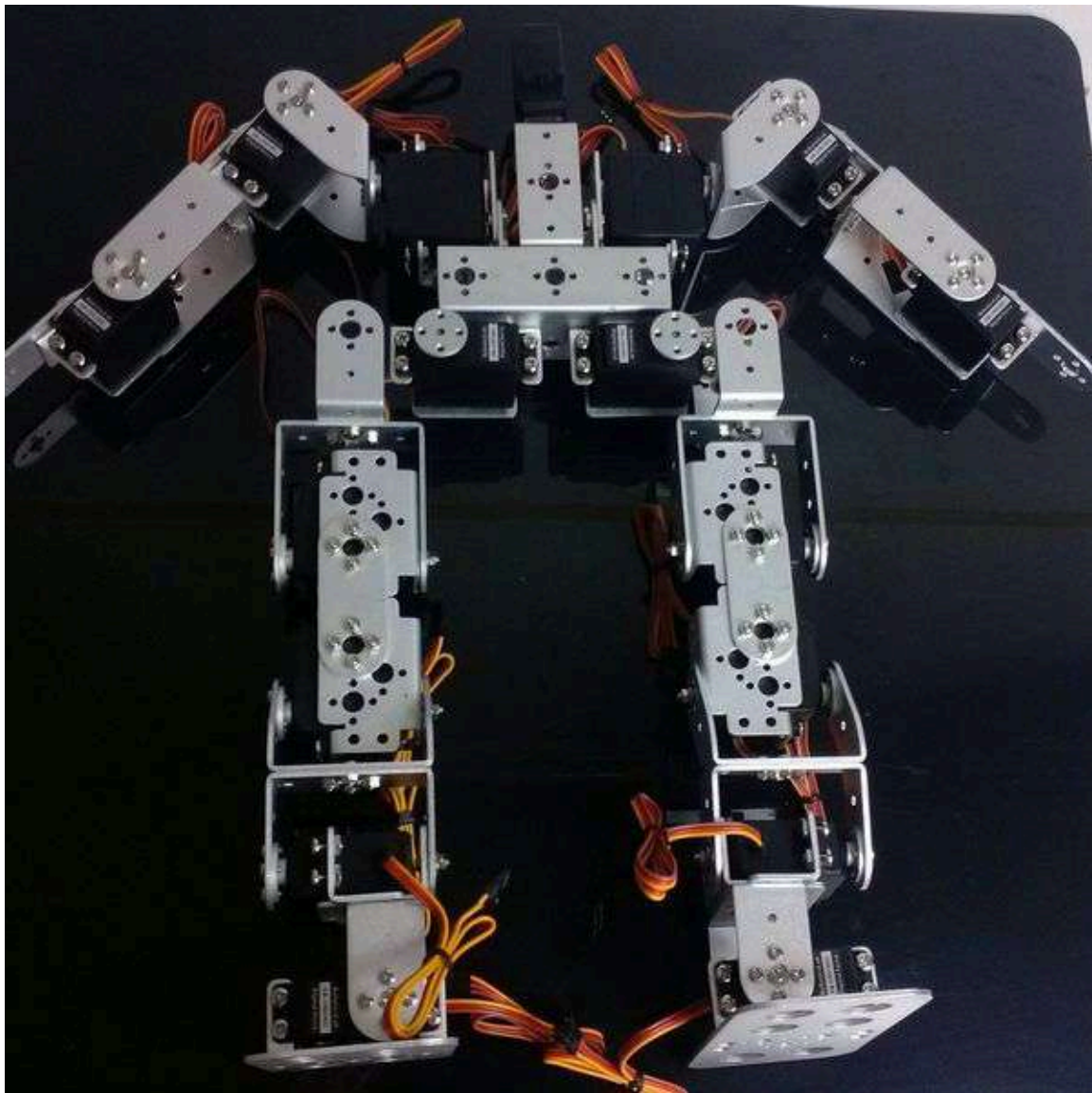
wheel is fixed to the top of the torso; then, two inclined U-brackets are fixed to the left and right shoulders of the robot's trunk. 1A servo is fixed on the neck of the robot's torso, and the front metal steering wheel is surrounded by 4 Round head M3*5 Screw fixing, middle hole for 1 Round head M3*6 Screw fixing.

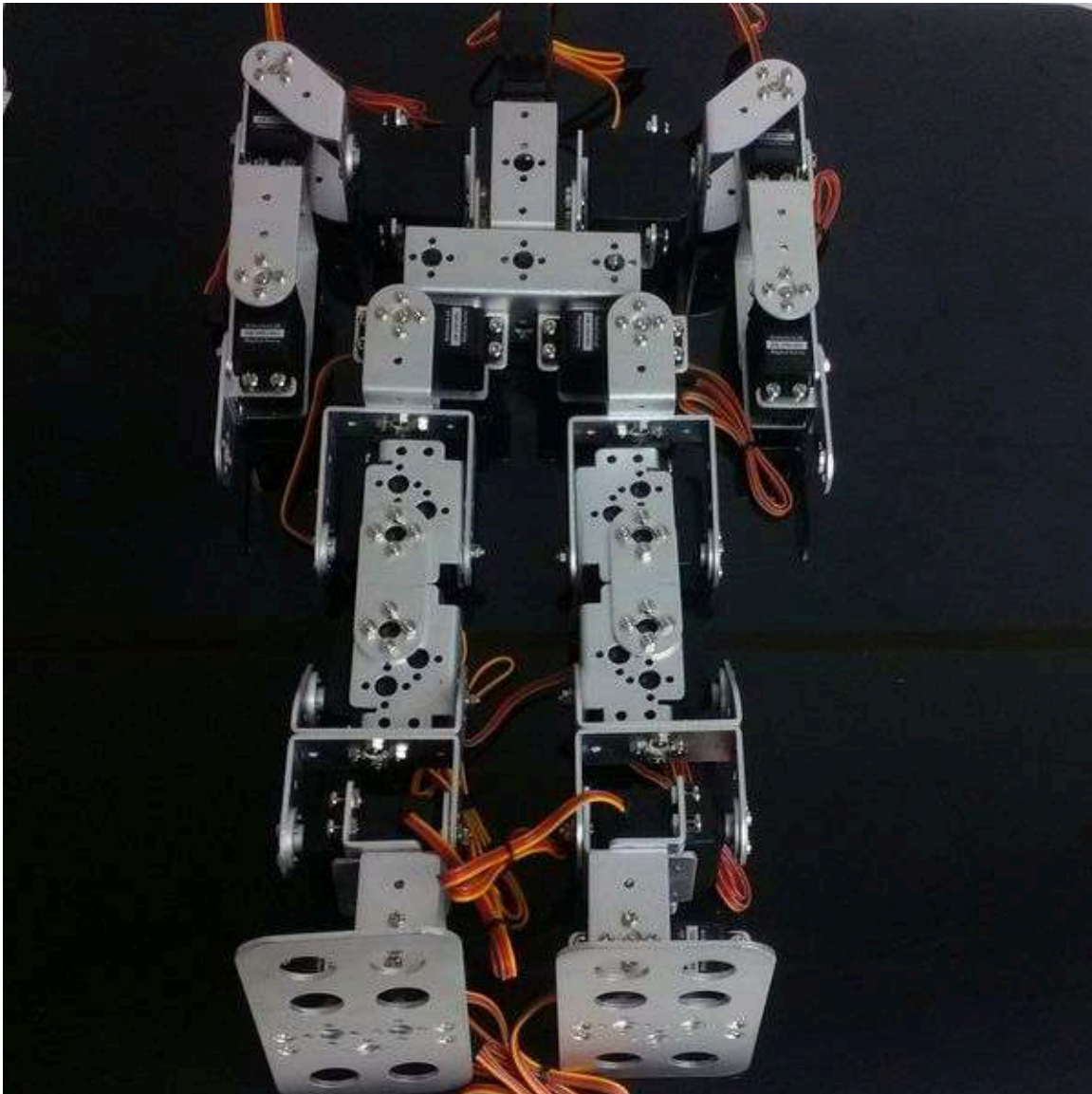
6, connect the robot's upper body



Take the robot arm structure and torso structure installed in the previous two steps. 1 Round head M3*5 screw 8 Round head M3*6 screw 2 individual, M3 Nuts 21. Flange bearings 2 Install as shown in the figure. Put the two installed structures together and use 4 Round head M3*5 Screw fixing, middle hole for 1 Round head M3*6 Fix with screws. Install a flange bearing on the virtual axis on the back, and then use M3 Tighten the nut to secure it. After installing the screws, use needle-nosed pliers to tighten them to achieve a stable structure.

7, connect the robot's lower body





Take the robot upper body structure and leg structure installed in the previous two steps
1 Round head M3*5screw 8 Round head M3*6screw 2 individual, M3Nuts 21. Flange bearings 2 Install as shown in the figure. Put the two installed structures together and use 4 Round head M3*5Screw fixing, middle hole for 1 Round head M3*6Fix with screws. Install a flange bearing on the virtual axis on the back, and then use M3 Tighten the nut to secure it. After installing the screws, use needle-nosed pliers to tighten them to achieve a stable structure.