1. Communication principle

The principle of this experiment is to use one of DOFBOT as a server, open TCP network services, receive data, and perform operations. Another DOFBOT as a client, that is, an operator, reads all servos angle value in turn.

Then, send the angle value of all servos to the server through the TCP service. At this time, the client always reads the angle value of the servos quickly and sends it to the server. The server receives and sets the angle of all the servos in client immediately.

According to the above working principle, we can make two mechanical arms realize synchronous action.

2. Preparation

2.1 This experiment needs to use two DOFBOT, except for the different running programs, other configurations can be the same. If your DOFBOT is using the system image provided by Yahboom. Please close the APP remote control program that starts automatically after booting, and then perform this experiment.
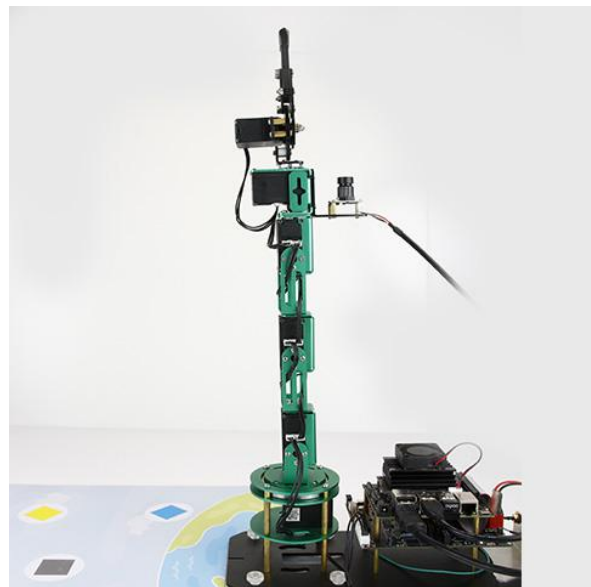
2.2 Ensure that both DOFBOT are connected to the same LAN.

2.3 In order to easily distinguish between the two DOFBOT, we set the DOFBOT used as the server is A, and set the DOFBOT used as the client is B.
Before starting the program, please adjust the A and B DOFBOT to the centered state. As shown below.

| A DOFBOT(server) | B DOFBOT(client) |

3. About code

A DOFBOT(server) code
Path: /home/dofbot/Dofbot/3.ctrl_Arm/12.sync_movement/A_arm_follow.py

B DOFBOT(client) code
Path: /home/dofbot//Dofbot/3.ctrl_Arm/12.sync_movement/ B_arm_ctrl.py

4. Experiment step

4.1 Open the terminal of A DOFBOT. Input following command to run the A_arm_follow.py program. Please remember the printed IP address.

cd /home/jetson/Dofbot/3.ctrl_Arm/12.sync_movement/
python3 A_arm_follow.py

```
jetson@jetson-desktop:~$ cd /home/jetson/Dofbot/3.ctrl_Arm/12.sync_movement/
jetson@jetson-desktop:~/Dofbot/3.ctrl_Arm/12.sync_movement$ ls
A_arm_follow.py   B_arm_ctrl.py
jetson@jetson-desktop:~/Dofbot/3.ctrl_Arm/12.sync_movement$ python3 A_arm_follow.py
192.168.2.101:6100
start_tcp_server
```

4.2 Open the terminal of B DOFBOT, write the IP address we recorded in the previous step into the B_arm_ ctrl.py. As shown below.

```
ip = '192.168.2.101'
port = 6100
try:
    connect_tcp_server(ip, port)
except KeyboardInterrupt:
    waitClose(g_sock)
    print(" Program closed! ")
    pass
```

4.3 After the modification is completed, save and exit. Then, input following command.

python3 B_arm_ctrl.py

```
jetson@jetson-desktop:~/Dofbot/3.ctrl_Arm/12.sync_movement$ python3 B_arm_ctrl.py
Connecting server...
Connected!
$20094154000001089170#
$20094154000001089170#
$20094154000001089170#
$20094154000001089170#
```

Run the A_arm_follow.py program of A DOFBOT first, and then run the B_arm_ctrl.py program of B DOFBOT.

The terminal of the B DOFBOT will print the connection information and print the sent data. At this time, the communication between the two robots be started up.

We can modify the posture of A DOFBOT by modifying the posture of B DOFBOT.