LROBRUYA

Smart Robot Arm Kit

Content

Preface

Company Profile

Founded in 2014, Shenzhen Lonten Technology Co., Ltd. focuses on the design, research production of Electronics Module for robotics related products. Consisting of professional researchers and skilled engineers, our R&D team constantly strives for creative function and excellent user experience. The company's R&D investments on arduino kits raspberry pi kits, as well as 3D printer and robots that back up STEAM education.

Customer Service

Our self-owned factory is certificated with BSCI and SO, covering an area of 5,000 square meters, and achieving an annual production capacity of over 10,000 units. Our products are all certified to CE, FCC, and ROHS standards, have exported to more than 100 countries including, but not limited to France, the United States of America, Australia, Russia, the United Kingdom, Germany, Singapore, Egypt, and India, bringing technological innovation to all walks of life.

Tutorial

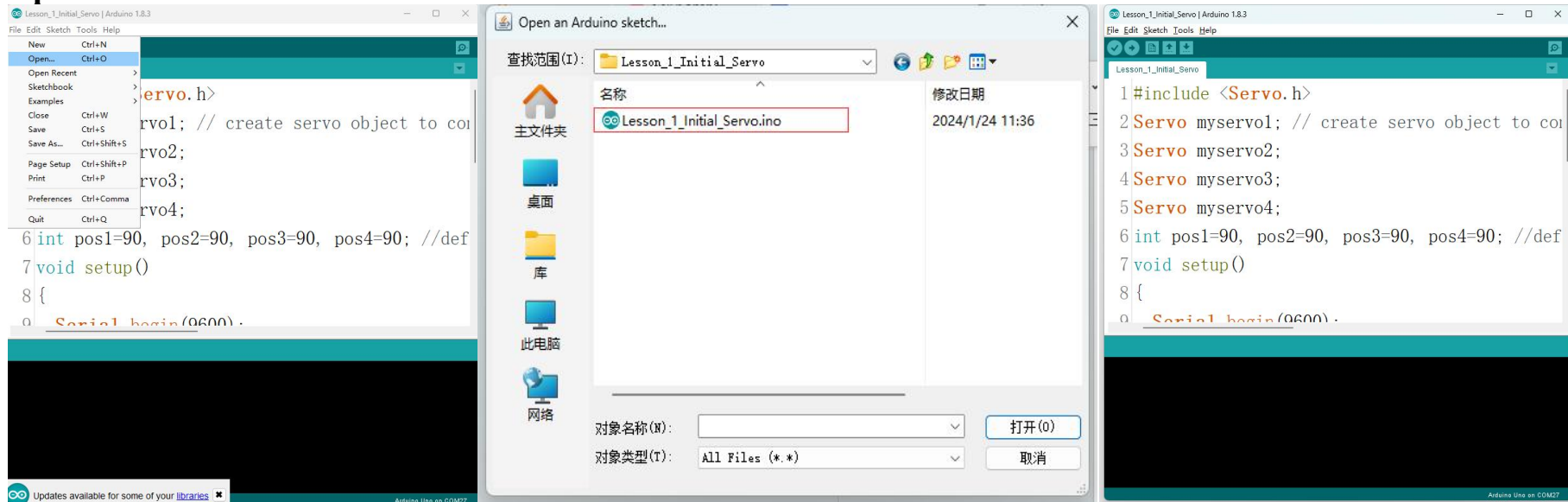This tutorial include codes, libraries and detailed user documentation.
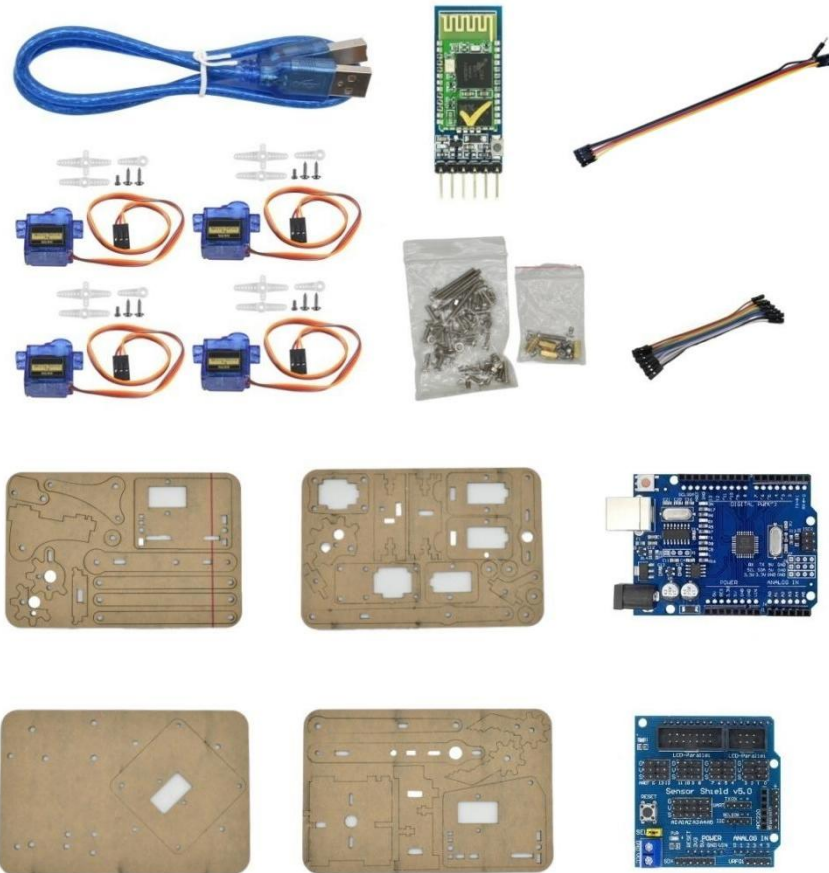
Lesson 1 Initial Servo

About this lesson

Firstly, it is necessary to initialize all servo angles to 90° so that errors will not occur during the later operation of the robotic arm.

Upload the code

Result

After uploading the code successfully,you will see the servo motor initialized successfully. The all servos will turn to the initial angle of 90° .

About this lesson

First, learn how to control a single servo motor.

Introduction

Servo motors are great devices that can turn to a specified position.Usually, they have a servo arm that can turn 180 degrees. Using the Arduino, we can tell a servo to go to a specified position and it will go there. As simple as that!Servo motors were first used in the Remote Control (RC) world, usually to control the steering of RC cars or the flaps on a RC plane. With time, they found their uses in robotics, automation, and of course, the Arduino world. There are two ways to control a servomotor with Arduino. One is to use a common digital sensor port of Arduino to produce square wave with different duty cycle to simulate PWM signal and use that signal to control the positioning of the motor. Another way is to directly use the Servo function of the Arduino to control the motor. In this way, the program will be easier.Next, we learn how to control the

servo.The servo motor has three leads. The color of the leads varies between servo motors, but the red lead is always 5V and GND will either be brown.The red one is the power wire and should be connected to the 5v port and signal control line is usually orange.

Wiring diagram
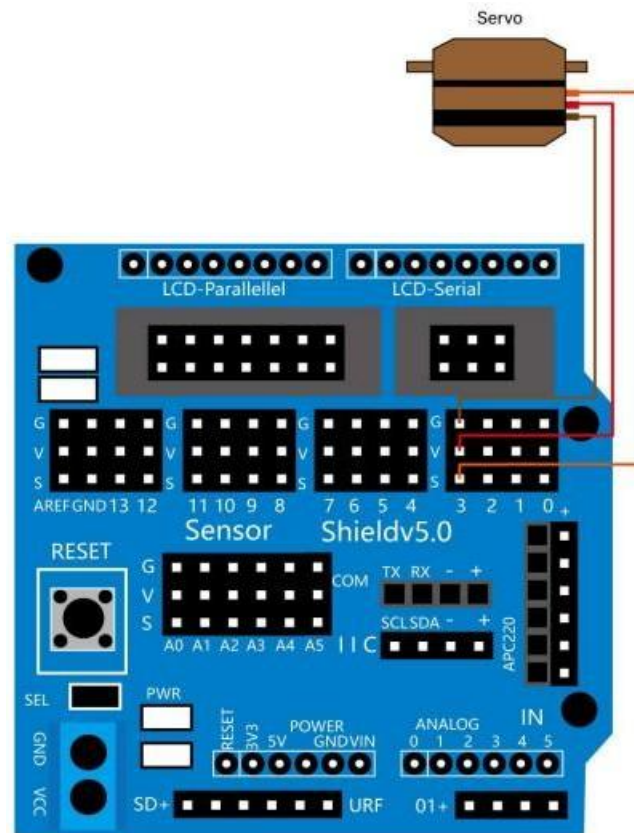
Result

After connecting,please open the the program and load up the code **Lesson_2_Single_Servo** onto your Arduino board. Before you can run this, make sure that you have installed the < Servo> library or re-install it, if necessary. Otherwise, your code won't work.For details about loading the library file, see <u>How to Install Arduino Driver</u>.

Lesson 3 Multiple Servo
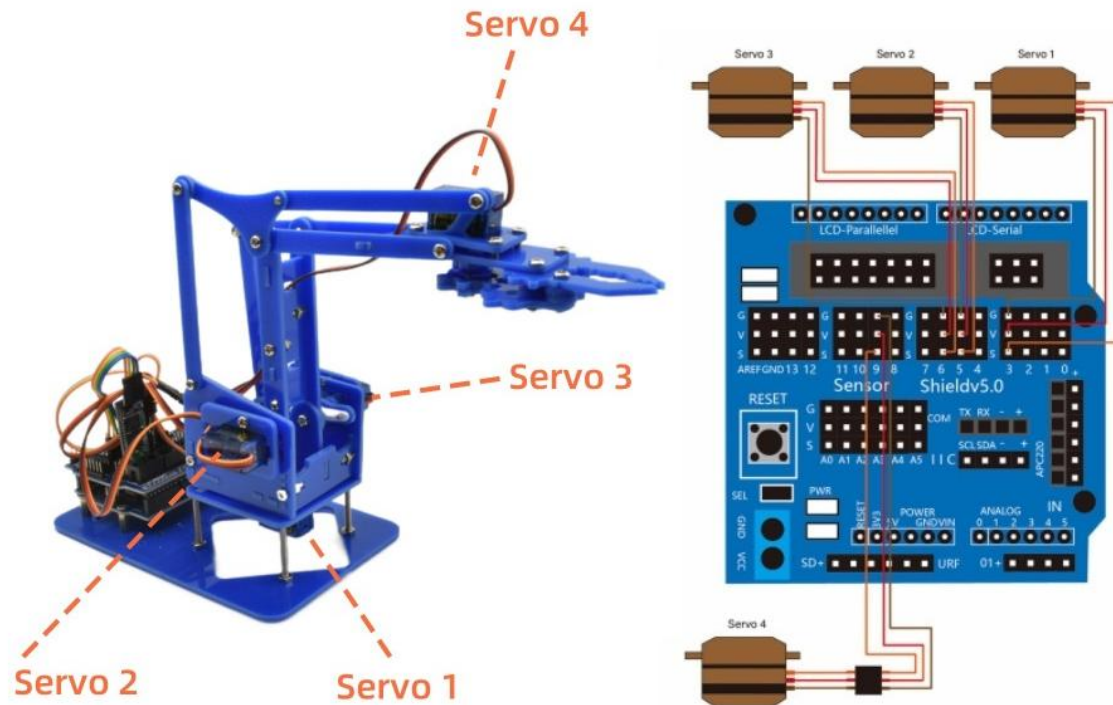
About this lesson

In this lesson, you will learn how to control four servo motors at the same time.

Introduction

On the basis of single servo motor control, we learn to control four servo motors at the same time.At this point, we need to be aware that the four servo motors are connected to different digital interfaces on the control board.

Wiring diagram

Result

After connecting,please open the the program and load up the code **Lesson_3_Multiple_Servo** onto your Arduino

board.upload well the code. Powered on, press the reset button, the robot arm will realize a cyclic motion. Grab the thing on

the left to the right.

Lesson 4 PS2 Module

About this lesson

In this lesson, we will learn how to send messages through the PS2 controller buttons and display them on the serial

port.But you need to purchase it by yourself because the PS2 Joypad is not included in the kit.
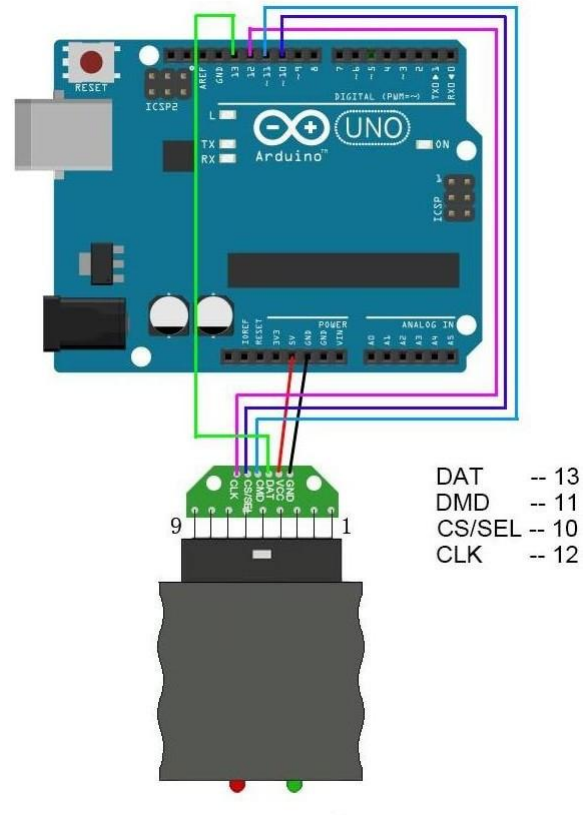
Introduction

PS2 consists of a handle and a receiver, with the handle mainly responsible for sending button information. When the power

is turned on and the handle switch is turned on, the handle and receiver automatically pair and connect. In the state of

unsuccessful pairing, the receiver's green light will flash, and the light on the handle will also flash. After successful pairing,

the receiver's green light will remain on, and the handle's light will also remain on. At this time, you can press the "MODE"

button to select the handle sending mode.

Pay attention to the sequins facing upwards

Wiring diagram

DAT   -- 13
DMD   -- 11
CS/SEL -- 10
CLK   -- 12

Result

After wiring, please open the program in the code folder--**Lesson_4_PS2_Module** and click UPLOAD to upload the program. You can press the PS2 controller button, and there will be corresponding output reminders on the serial port.

Lesson 5 PS2 Control Arm

About this lesson

Learn the PS2 Joypad to control the movement of the robot arm.

Result

After wiring, please open the program in the code folder--**Lesson_5_PS2_Control_Arm** and click UPLOAD to upload the program. But before upload the program,should place the PS2X_lib folder inside the libraries folder of Arduino IDE

directory.We provide PS2X_lib library files in the library on the tutorial. After successfully uploading the program, turn on the PS2 handle power switch. The signal light will flash. When the signal stop flashing, the controller and the receiver will be connected successfully.The control relationship between joystick and manipulator on handle is as follows.

Right Joystick	arm	Left Joystick	arm
X1<50	Push the left joystick to the right,the claw closed	X2<50	Push the right joystick to the left,the servo that controls the arm rotation turns left
X1>200	Push the left joystick to the left,the claw opens	X2>200	Push the right joystick to the right,the servo that controls the arm rotation turns right
Y1<50	Push the left joystick to the down,lower the robot upper arm	Y2<50	Push the right joystick to the up,stretch out the robot lower arm
Y1>200	Push the left joystick to the up,lift up the robot upper arm	Y2>200	Push the right joystick to the down,draw back the robot lower arm

About this lesson

In this lesson,we will learn how to use the Bluetooth Module.

Introduction

The HC05 is a Serial port Bluetooth module which having fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping Feature).

We use the serial port communication function of the Bluetooth module, use the app to control the Bluetooth connection of the mobile phone and the HC-05 Bluetooth module, and then the mobile phone app sends data, and the HC-05 Bluetooth module transmits the received data to the arduino uno through the serial port. The default communication baud rate of the HC-05 Bluetooth module is 9600.

VCC>>>> +

GND>>>> -

TXD>>>>RX

RXD>>>>TX
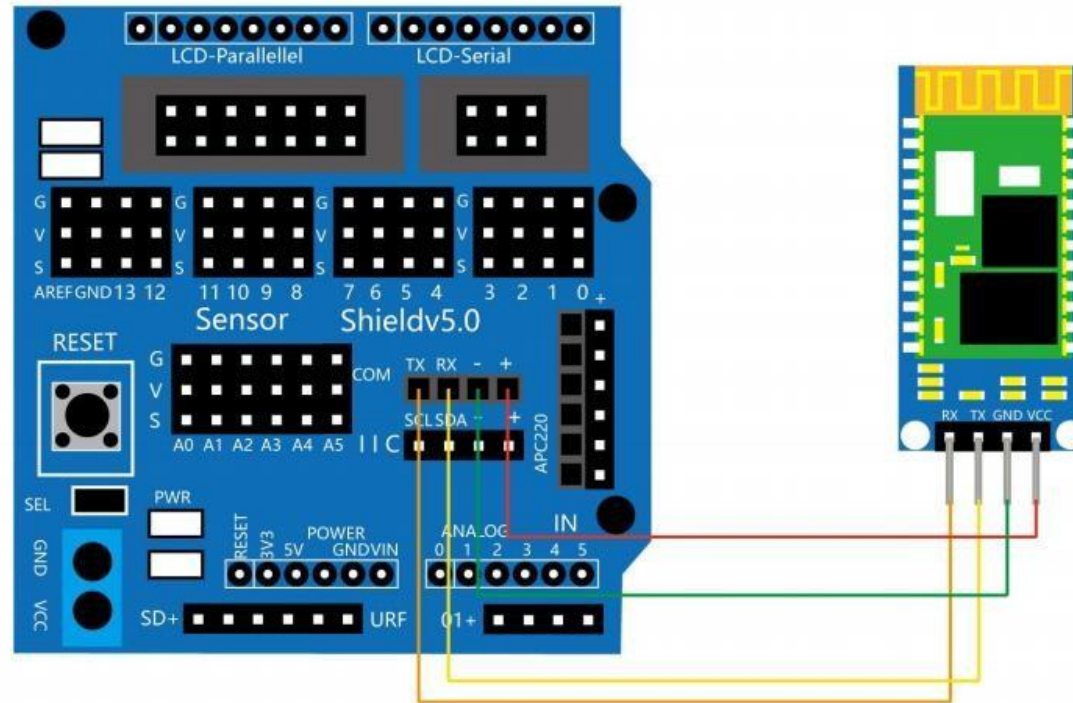
Attention

The bluetooth module should be pulled out before you upload the program every time,or it will be failed to

upload the program.When uploading the code, CANNOT connect the Bluetooth module first; otherwise uploading fails! You are supposed to upload the code to control board, then connect the Bluetooth module.

Lesson 7 Bluetooth Controlling Arm

Instructions for the use of app

Firstly, download the "**LONTEN_Robot_Arm.apk**" file from the folder to your mobile phone and install it into an application software.
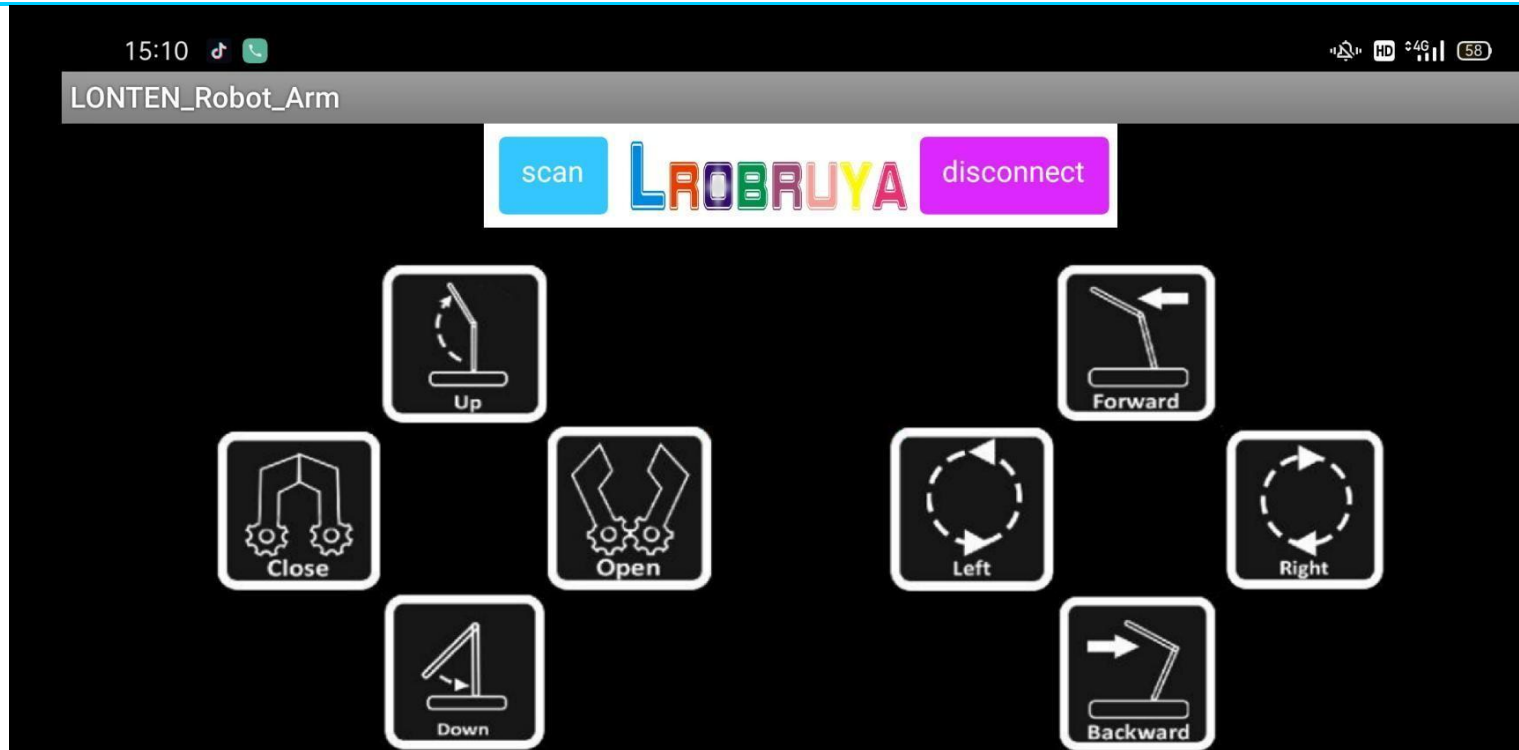
Then make sure the Bluetooth module is connected. Pair your phone with HC-05. for doing this go to

Settings->Bluetooth->Scan device->select HC-05 and pair it. Pass code to pair is '1234'.

Open Bluetooth Terminal software, go to options and select 'connect a device - secure' option. It it ask for pass code enter

1234.If your phone is connected to the Bluetooth module, you will see a usable device called HC-05 on the PAIRED

DEVICES(As shown below).If the HC-05 does not appear on the PAIRED DEVICES, reoperate the above steps.
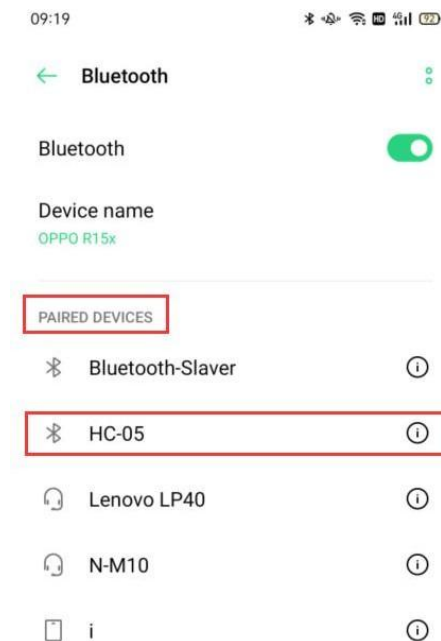
After the above steps are complete, we open the **LONTEN_Robot_Arm app**.

Click the button"scan" . the HC-05 will appear in our scan results.Select HC-05.

After selecting the HC-05 device, click button will to connect ."scan" will be "connect".
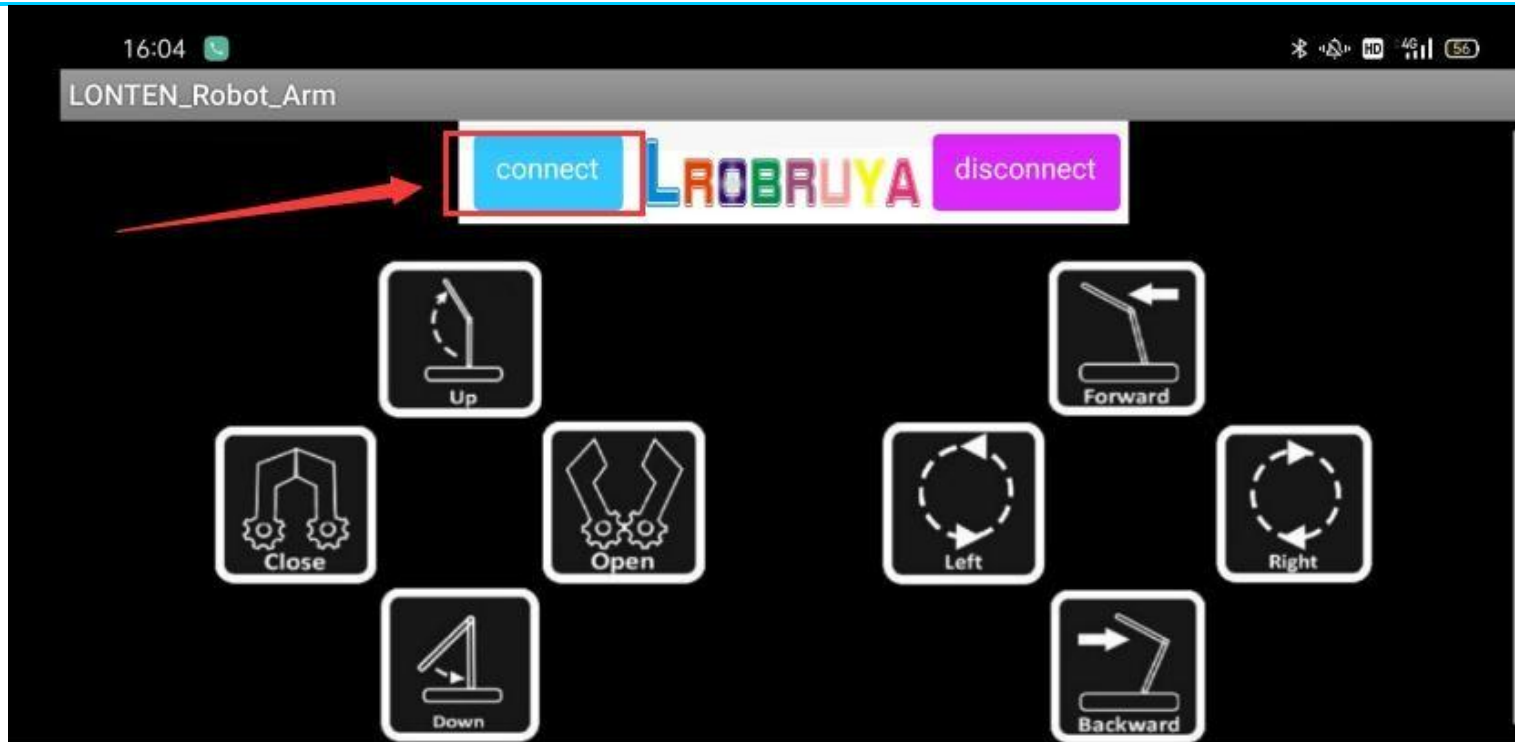
(Note: When the Bluetooth module is not successfully connected, the red LED light will continue to flash. When the connection is successful, the red LED light will be remain on.)

Result

After wiring, please open the program in the code folder--**Lesson_7_Bluetooth_Controlling_Arm** and click UPLOAD to upload the program.After the code has been successfully uploaded to the UNO board, reconnect the Bluetooth.Repeat the steps above regarding the app connection to the Bluetooth module.Now that the app has successfully connected to Bluetooth, we can begin to control the robotic arm through the app.

APP KEY	Value
	Upper the robot lower arm
	The claw closed
	The claw opens

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Down	Lower the robot upper arm
Forward	Stretch out the robot lower arm
Left	Turns left
Right	Turns right
Backward	Draw back the robot lower arm