Bionic Robot Hand SKU: ROB0142 & ROB0143



Introduction

The bionic robot hand is made up of acrylic material. It consists of 5 micro metal servos, joints and one hand base. The special mechanical structure makes every finger can be controlled separately, all can move in certain range. And every finger has spring damping structure, it will protect the robotic hand from the mechanical stress effectively. With 24 channel Veyron servo driver, all actions can be controlled via PC software, supporting online debug and wireless control.
The bionic robot hand can be controlled by Arduino and other Servo controllers. It can grab 500g object, and it is the best option for DIY robot hand demonstration. The servo can be connected directly to the arduino IO expansion shield or the Romeo robot microcontroller, and arduino servo library makes it easier to use.

Note: Please be careful with the servo control, even if there is damping structures on each finger, the non-standard operation will still damage the servos.

Specification

- Operating Voltage: 4.8-6V
- Control Signal: 1.0ms~2.0ms (45~135°)
- Operating Current: 2A
- Payload: 500g
- Servo Torque: 2.4kg*cm (4.8v) 2.8kg*cm (6v)
- Servo Speed: 0.11 "/ 60 ° (4.8v) 0.09" / 60 ° (6.0 V)
- Operating Temperature: 0 ~ 55 ℃
- Cable: Brown <-> GND
- Red <-> VCC
- Orange<->Signal
- Servo Dimension: 23 * 12.2 * 29mm /0.91*0.48*1.14 inches
- Hand Dimension: 330 mm / 12.99 inches (Height)
- Servo net weight: 14g
- Weight: 896g (Whole kit)

Tutorial

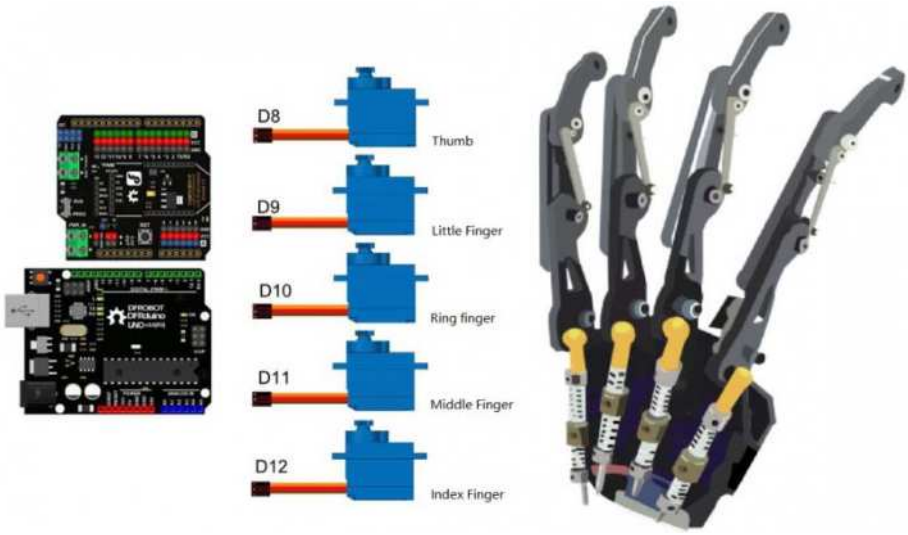
In this tutorial, we'll demonstrate a simple way to control the robot hand.

Requirements

- **Hardware**
  DFRduino UNO (or similar) x 1
  Gravity: IO Expansion Shield for Arduino

- **Software**
  Arduino IDE, Click to Download Arduino IDE from Arduino®
  https://www.arduino.cc/en/Main/Software

Connection Diagram



Bionic Robot Hand Arduino Connection

Sample Code

```
/*!
   @file ROB0142.ino
   @brief Bionic Robot Hand
   @n [Get the module here]()
   @n This example show 0-9 the 10 Numbers.
   @n [Connection and Diagram]()

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   @author: (ju.li@dfrobot.com)
   @version  V1.0
   @date  2017-03-01
*/

#include <Servo.h>

Servo Saservo;
Servo Sbservo;
Servo Scservo;
Servo Sdservo;
Servo Seservo;

int Sa = 90;  // default Position
int Sb = 50;  //
int Sc = 40;  //
int Sd = 50;  //
int Se = 50;  //



void setup()
{
  Serial.begin(9600);  //Serial Baudrate
```

```
  Saservo.attach(8);   //thumb servo
  Sbservo.attach(9);   //little finger servo
  Scservo.attach(10);  //ring finger servo
  Sdservo.attach(11);  //middle finger servo
  Seservo.attach(12);  //index finger servo

  Saservo.write(90);   //thumb
  Sbservo.write(50);   //little finger
  Scservo.write(40);   //ring finger
  Sdservo.write(50);   //middle finger
  Seservo.write(50);   //index finger
  delay(1000);
}

void loop()
{
  char cc;  //
  while (Serial.available() > 0)  //
  {

    cc = Serial.read();  //
    if (cc == 'a')  //
    {
      // spread the fingers
      for (Sa = 90; Sa <= 160; Sa += 1) //thumb
      {
        Saservo.write(Sa);
        delay(15);
      }

      for (Sb = 50; Sb <= 150; Sb += 1) //little finger
      {
        Sbservo.write(Sb);
        delay(15);
```

```
}

for (Sc = 40; Sc <= 130; Sc += 1) //ring finger
{
  Scservo.write(Sc);
  delay(15);
}

for (Sd = 50; Sd <= 150; Sd += 1) //middle finger
{
  Sdservo.write(Sd);
  delay(15);
}

for (Se = 50; Se <= 140; Se += 1) //index finger
{
  Seservo.write(Se);
  delay(15);
}
delay(1000);

//close the fingers
for (Sa = 160; Sa >= 90; Sa -= 1)
{
  Saservo.write(Sa);
  delay(15);
}

for (Sb = 150; Sb >= 50; Sb -= 1)
{
  Sbservo.write(Sb);
  delay(15);
}
```

```
    for (Sc = 130; Sc >= 40; Sc -= 1)
    {
      Scservo.write(Sc);
      delay(15);
    }

    for (Sd = 150; Sd >= 50; Sd -= 1)
    {
      Sdservo.write(Sd);
      delay(15);
    }

    for (Se = 140; Se >= 50; Se -= 1)
    {
      Seservo.write(Se);
      delay(15);
    }

  }
  //9
  if (cc == '9')
  {
    Saservo.write(90);//thumb
    Sbservo.write(50);//little finger
    Scservo.write(40);//ring finger
    Sdservo.write(50);//middle finger
    Seservo.write(110);//index finger
  }



  //8
  if (cc == '8')
  {
    Saservo.write(160);//thumb
```

```
  Sbservo.write(50);//little finger
  Scservo.write(40);//ring finger
  Sdservo.write(50);//middle finger
  Seservo.write(140);//index finger
}


//7
if (cc == '7')
{
  Saservo.write(160);//thumb
  Sbservo.write(50);//little finger
  Scservo.write(40);//ring finger
  Sdservo.write(150);//middle finger
  Seservo.write(140);//index finger
}


//6
if (cc == '6')
{
  Saservo.write(160);//thumb
  Sbservo.write(150);//little finger
  Scservo.write(40);//ring finger
  Sdservo.write(50);//middle finger
  Seservo.write(50);//index finger
}


//5
if (cc == '5')
{
  Saservo.write(160);//thumb
  Sbservo.write(150);//little finger
```

```
  Scservo.write(130);//ring finger
  Sdservo.write(150);//middle finger
  Seservo.write(140);//index finger
}


//4
if (cc == '4')
{
  Saservo.write(90);//thumb
  Sbservo.write(150);//little finger
  Scservo.write(130);//ring finger
  Sdservo.write(150);//middle finger
  Seservo.write(140);//index finger
}


//3
if (cc == '3')
{
  Saservo.write(90);//thumb
  Sbservo.write(50);//little finger
  Scservo.write(130);//ring finger
  Sdservo.write(150);//middle finger
  Seservo.write(140);//index finger
}


//2
if (cc == '2')
{
  Saservo.write(90);//thumb
  Sbservo.write(50);//little finger
  Scservo.write(40);//ring finger
```

```
      Sdservo.write(150);//middle finger
      Seservo.write(140);//index finger
    }



    //1
    if (cc == '1')
    {
      Saservo.write(90);//thumb
      Sbservo.write(50);//little finger
      Scservo.write(40);//ring finger
      Sdservo.write(50);//middle finger
      Seservo.write(140);//index finger
    }



    //0
    if (cc == '0')
    {
      Saservo.write(90);//thumb
      Sbservo.write(50);//little finger
      Scservo.write(40);//ring finger
      Sdservo.write(50);//middle finger
      Seservo.write(50);//index finger
    }

  }
}
```

Expected Results

After downloading the sample code, you can enter following characters to control the hand action:

- a: all fingers open; all fingers closed
- 0: show gesture "0"
- 1: show gesture "1"
- 2: show gesture "2"
- 3: show gesture "3"
- 4: show gesture "4"
- 5: show gesture "5"
- 6: show gesture "6"
- 7: show gesture "7"
- 8: show gesture "8"
- 9: show gesture "9"