

Creative Robotics
Workshop by Varvara Guljajeva
10.-11.12.2010 at Servus, Linz

Motors

- DCmotor

- Stepper motor (1step per pulse)
 1. unipolar motors - two windings per phase, they are probably the cheapest way to get precise angular movements.
 2. bipolar motors - single winding per phase, more complicated to control but more powerful

- Servo motor
 - moves from 0 to 180 or 270 degrees

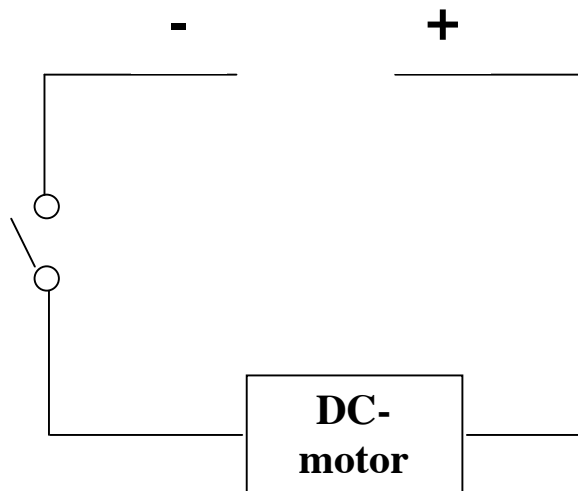
PS! Before applying any motor, check its voltage and current!

EXERCISES

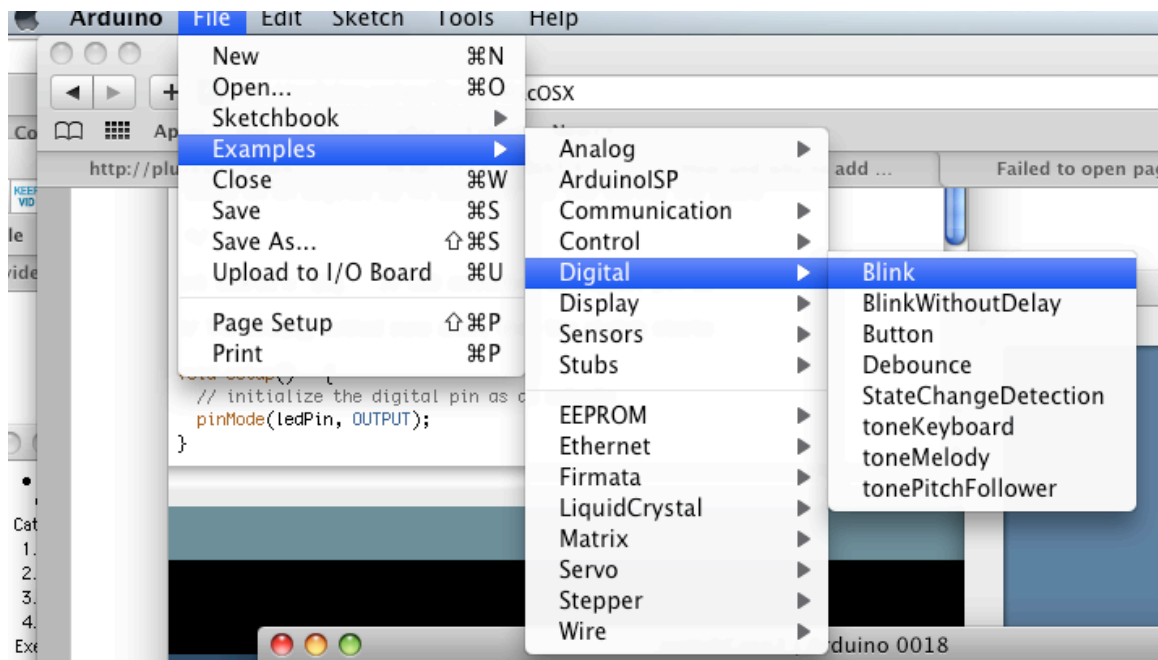
DCmotor

- simple to use
- 2 wires
- direction can be controlled by h-bridge

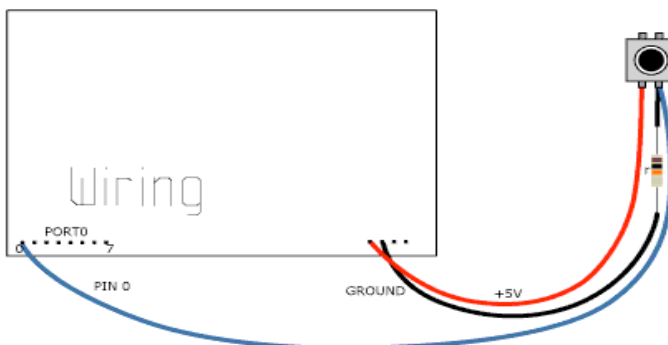
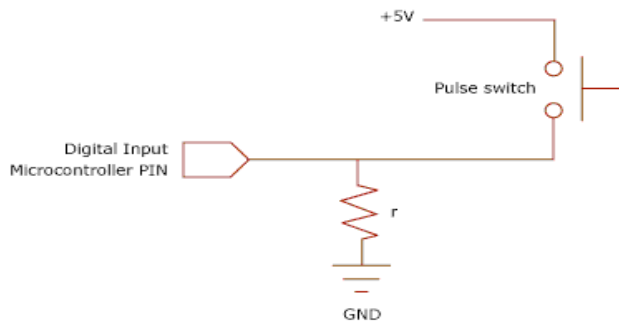
1. turn DC motor on and off with a switch or a push button



Arduino: One wire of motor goes to ground, another to pin.
- try LED example for driving a motor



For advanced: add button and DCmotor to Arduino

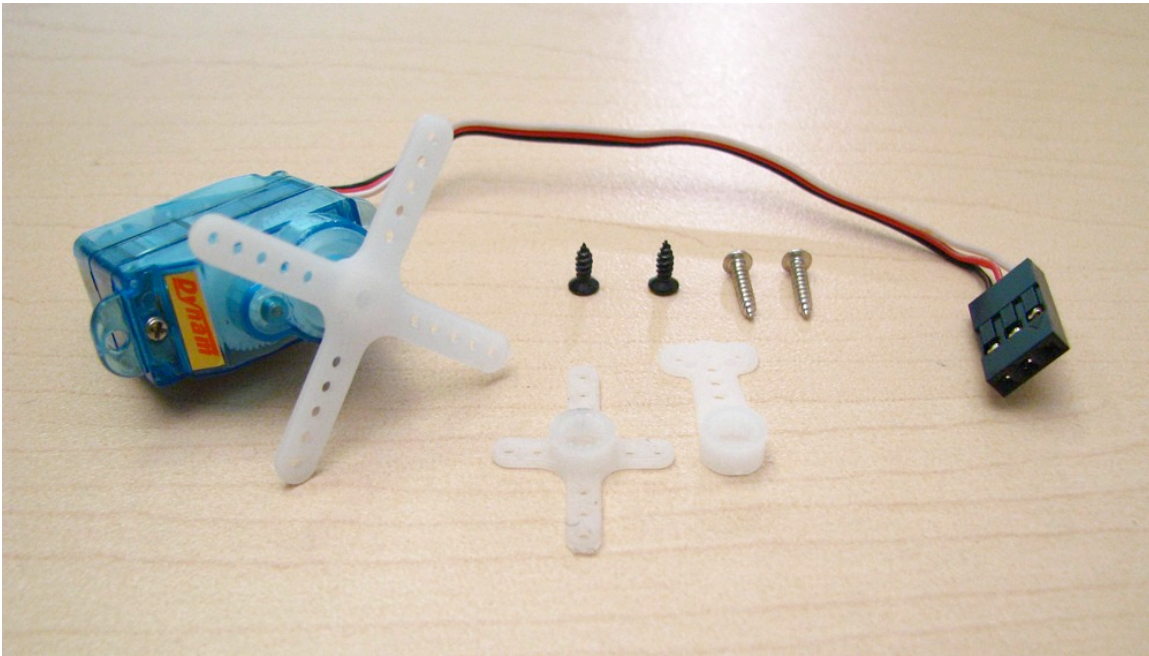


- Try 'button' example in Arduino

Servo motor

- Servo motor is quite different from DC motor.
- This motor moves from 0 to 180 or 270 degrees, depending on the model.
- Control signal sets the position.

The good thing is that Arduino has a library for servo motor and the component can be easily control, but only if it is plugged into pins with **PWM** output (usually pin 9, 10 or 11). Otherwise one has to deal with pulses.



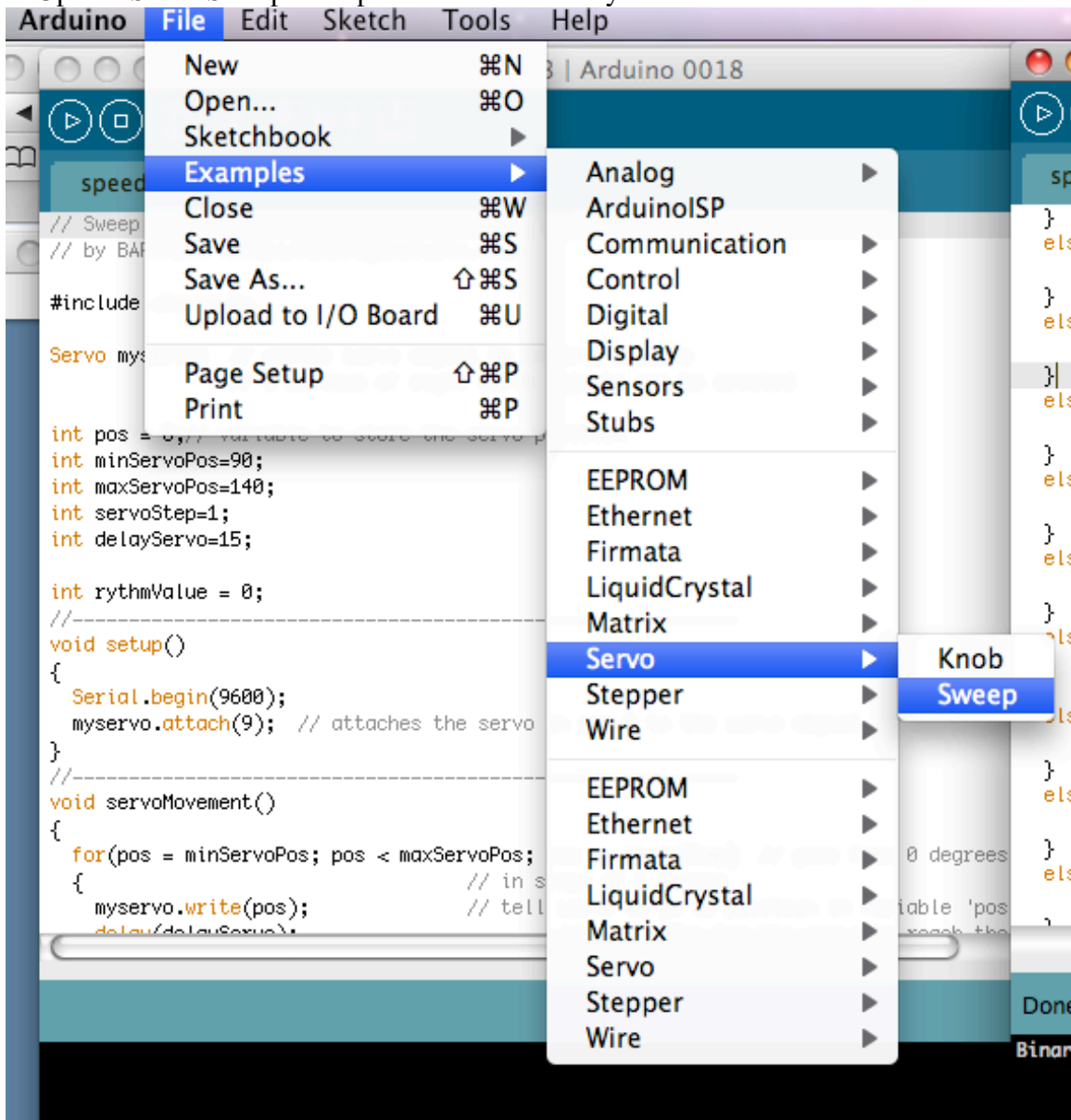
Servo motor has 3 wires:

Black for ground

Red for power

White (or some other color) for control (into arduino pin 9, 10 or 11)

1. Upload Servo Sweep example to Arduino and try to make servo move



2. Modify the code in order to achieve different movement of motor

3. Add second servo

4. try other way to move servo

```
#include <Servo.h>
```

```
Servo myservo; // create servo object to control a servo
```

```
void setup()
{
  myservo.attach(9); // attaches the servo on pin 9 to the servo object
}

void loop()
{

  myservo.write(30);
  delay(150);
  myservo.write(60);
  delay(150);
}
```

**Use now Styrofoam for constructing the body of robot.
Add DC- and/or servomotors for making your creature move!
Experiment and synchronize movements.**