Next Steps for Your Final Project

Reflect on your midterm project. You may expand your midterm project, or take a new approach to a Tangible User Interface that takes advantage of human senses beyond traditional user interfaces.

You may continue to work as a group (maximum of 3 members) or as an individual. If you work in a group, be clear about each member's role in the project.

Next Steps for Your Final Project

10/30
Finalize your group for project and post your proposal on the course website.
Create a list of materials you need. (We may be able to help.)

11/15 & 11/20
In-class final project progress report and critique.

12/9 & 12/11
Final project exhibition. Present your prototype.

12/15 Final write up due in the ACM SIGCHI Extended Abstract format (6-8pgs)

Recommendations

Do your background research

Towards “publishable quality” work

- Avoid making redundant effort
- Discuss rationale for your design and your contributions

Engage in many design critiques, early

Iterate! Share your idea with others and test its potential, early.

Use the resources

Kimiko: Tuesdays 1-2pm at South Hall 314,
Thursdays 3:30-4:30 at South Hall 110, and by appointment.
Patrick: Wednesdays 1-2pm at Stanley Hall B144, and by appointment.
Reza: by appointment
Liz: by appointment

	Tuesday LECTURE		Thursday LAB	
Week 1			08/28	Introduction
Week 2	09/02	Activity Theory and HCI	09/04	Introduction to Physical Computing
Week 3	09/09	Tangible Bits	09/11	Digital I/O with Arduino Boards
Week 4	09/16	Containers, Tools, and Token: Taxonomy of TUIs	09/18	Sensing 1: Potentiometers
Week 5	09/23	Calm Computing and Ambient Media	09/25	Sensing 2: Force sensors and photocells
Week 6	10/30	Human Centered Design	10/02	Output 1: Piezo speakers
Week 7	10/07	Design and Innovation	10/09	Output 2: DC motors
Week 8	10/14	Midterm Project Review	10/16	Output 3: Servo motors
Week 9	10/21	Guest Lecture by Hayes Raffle	10/23	Output 4: Simple Mechanics
Week 10	10/28	Guest Lecture by Wendy Ju	10/30	Synthesis 1: Invent a music instrument (group work)
Week 11	11/04	Guest Lecture by Liz Goodman	11/06	Synthesis 2: Invent a music instrument (group work)
Week 12	11/11	No class: Holiday	11/13	Guest Lecture by Mike Kuniavsky (ThingM)
Week 13	11/18	Final Project Progress Report and Critique	11/20	Final Project Progress Report and Critique
Week 14	11/25	Evaluating TUIs	11/27	No class: Thanksgiving holiday
Week 15	12/02	Guest Lecture by Patrick Goodwill	12/04	Summary
Week 16	12/09	Final Project Exhibition (Part I)	12/11	Final Project Exhibition (Part II)

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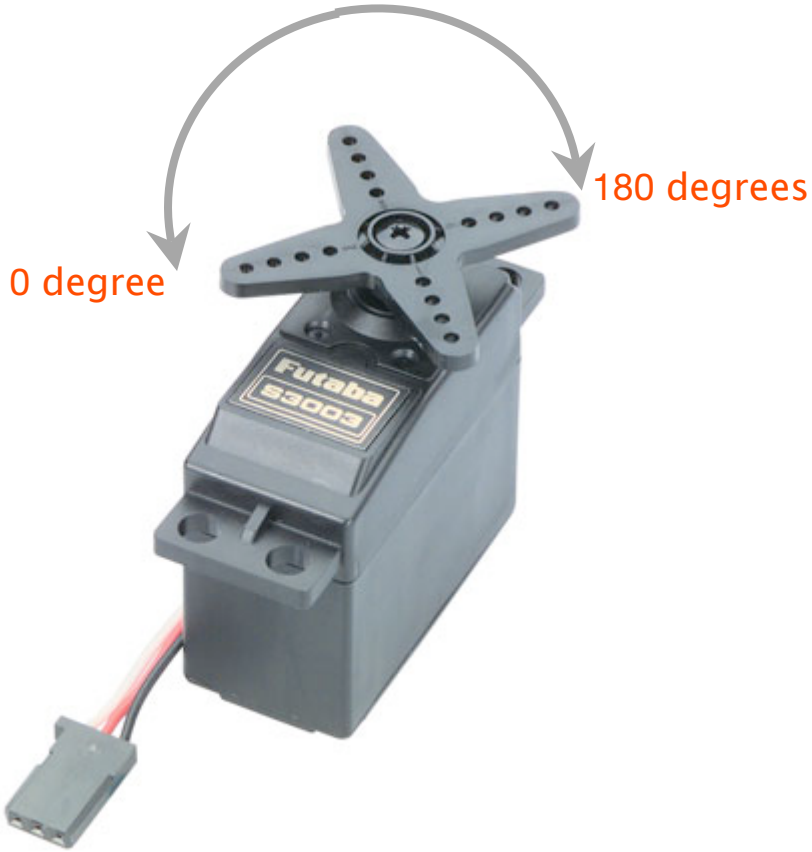
week
08

Output 3: Servo Motors

Making motions with servo motors

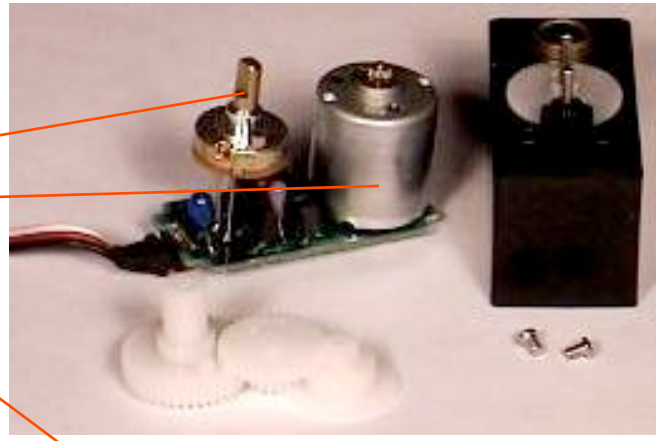
Servo Motor

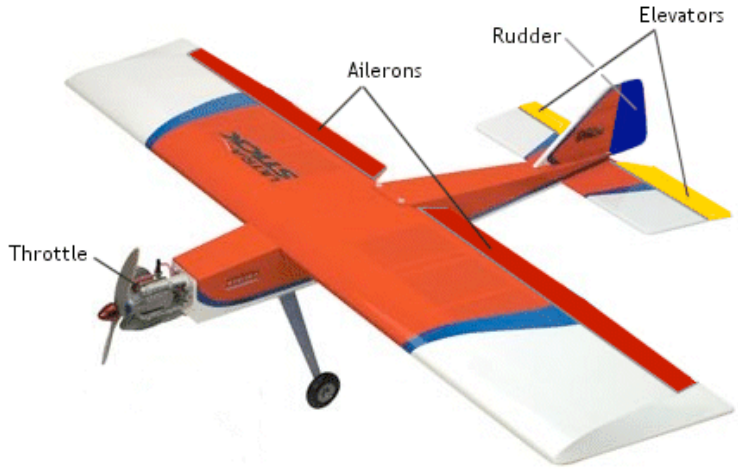
Servo Motor

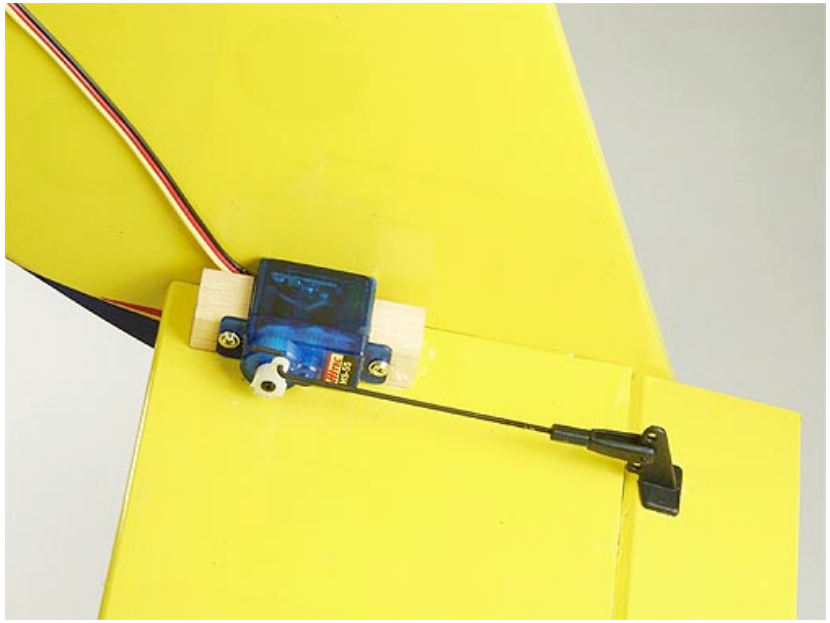


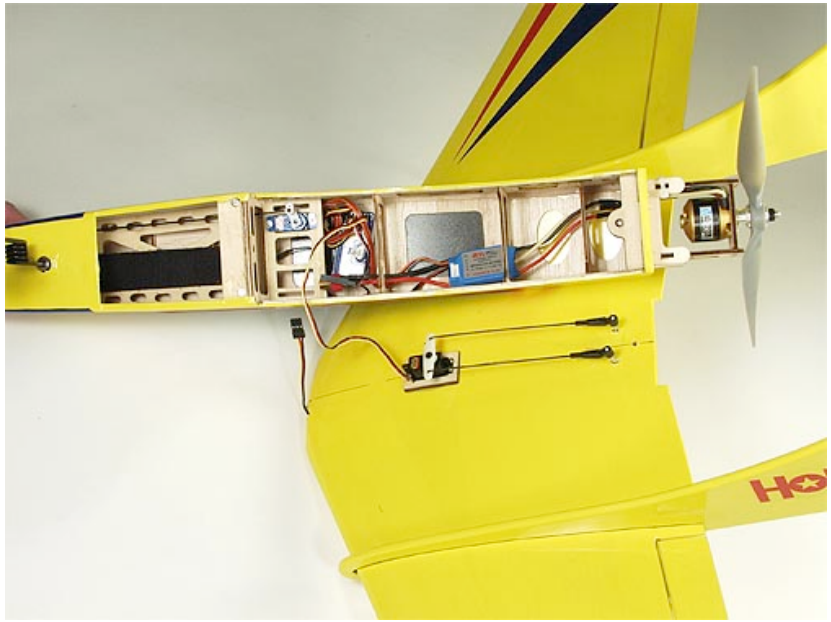
Servo Motor

1. Gears
2. Potentiometer
3. Motor
4. Electronics

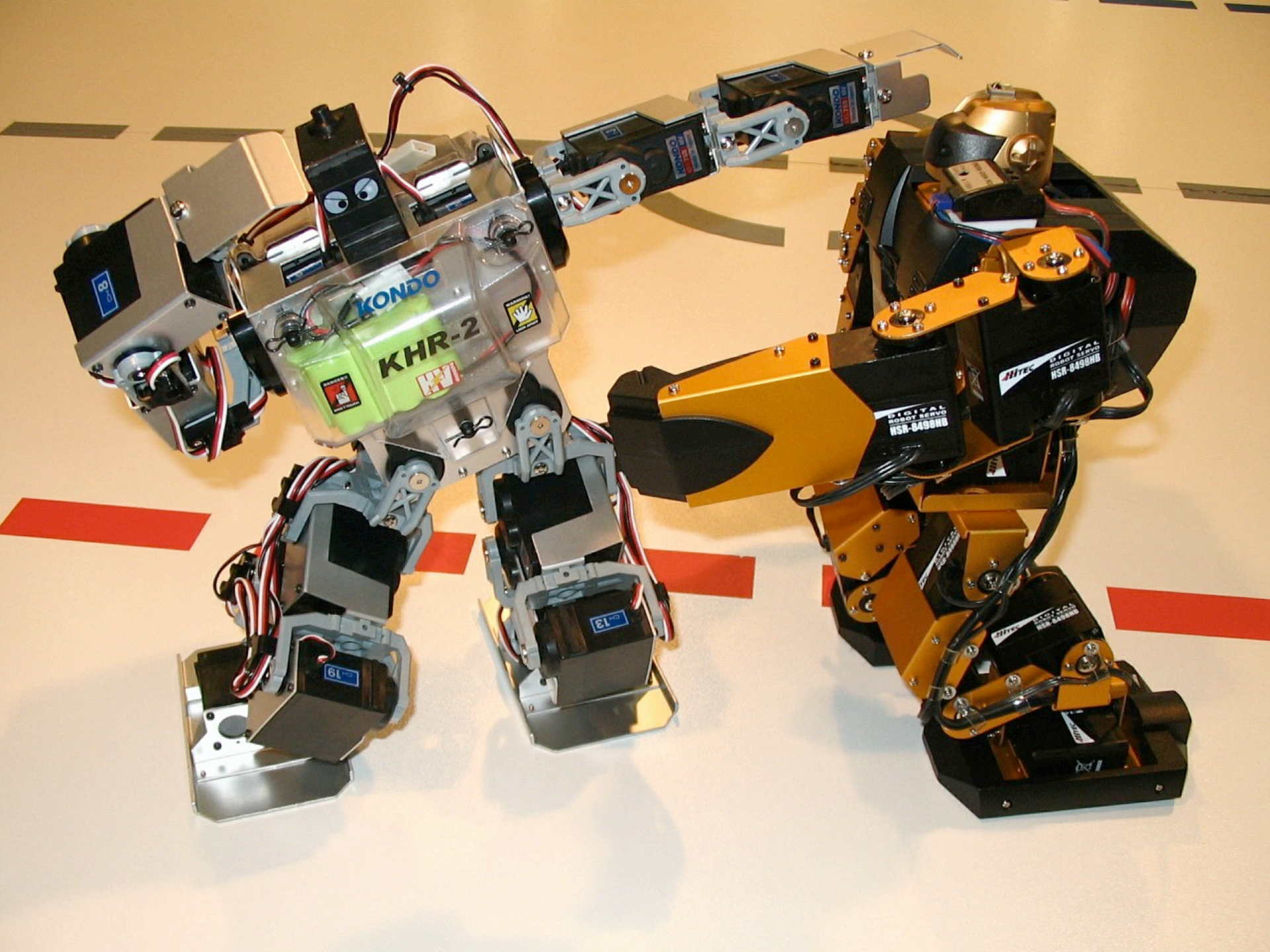


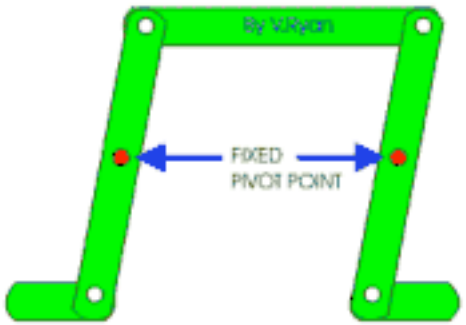






http://www.hobby-lobby.com/vdiamond.htm


KONDO
KHR-2
DIGITAL
ROBOT SERVO
HSR-8498HB



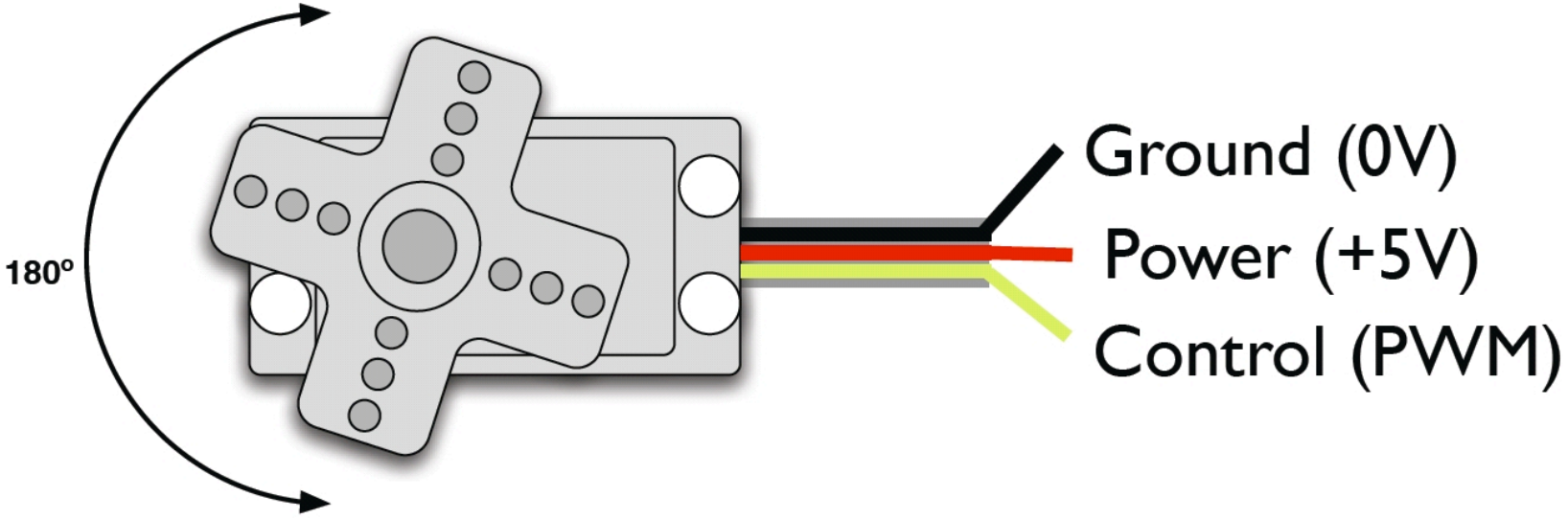
Parallel Motion Linkage

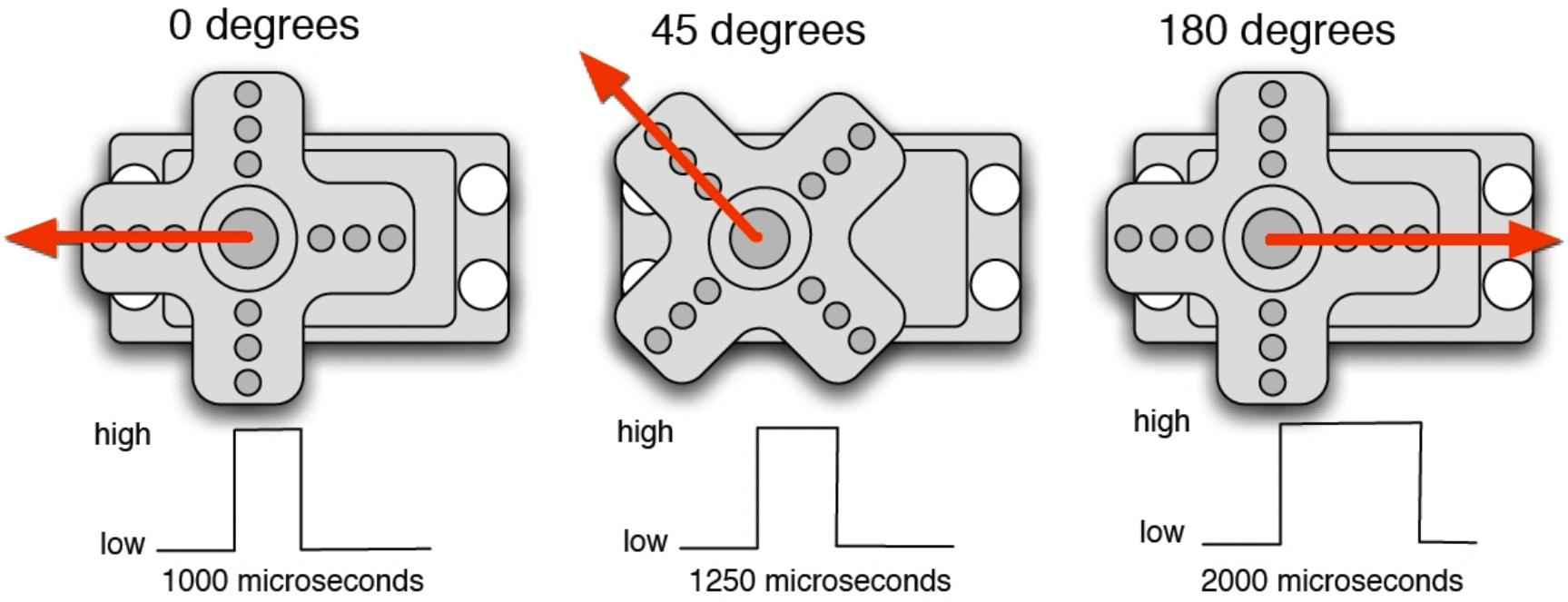
Mechanism Inside a Toolbox

http://www.technologystudent.com/cams/link1.htm

4~6g

37.2g (1.3oz)


180º
Ground (0V)
Power (+5V)
Control (PWM)


0 degrees
high
low
1000 microseconds
45 degrees
high
low
1250 microseconds
180 degrees
high
low
2000 microseconds

Servo Motor

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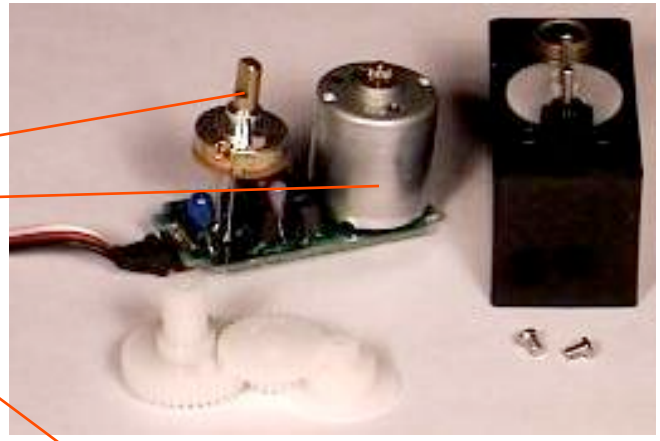
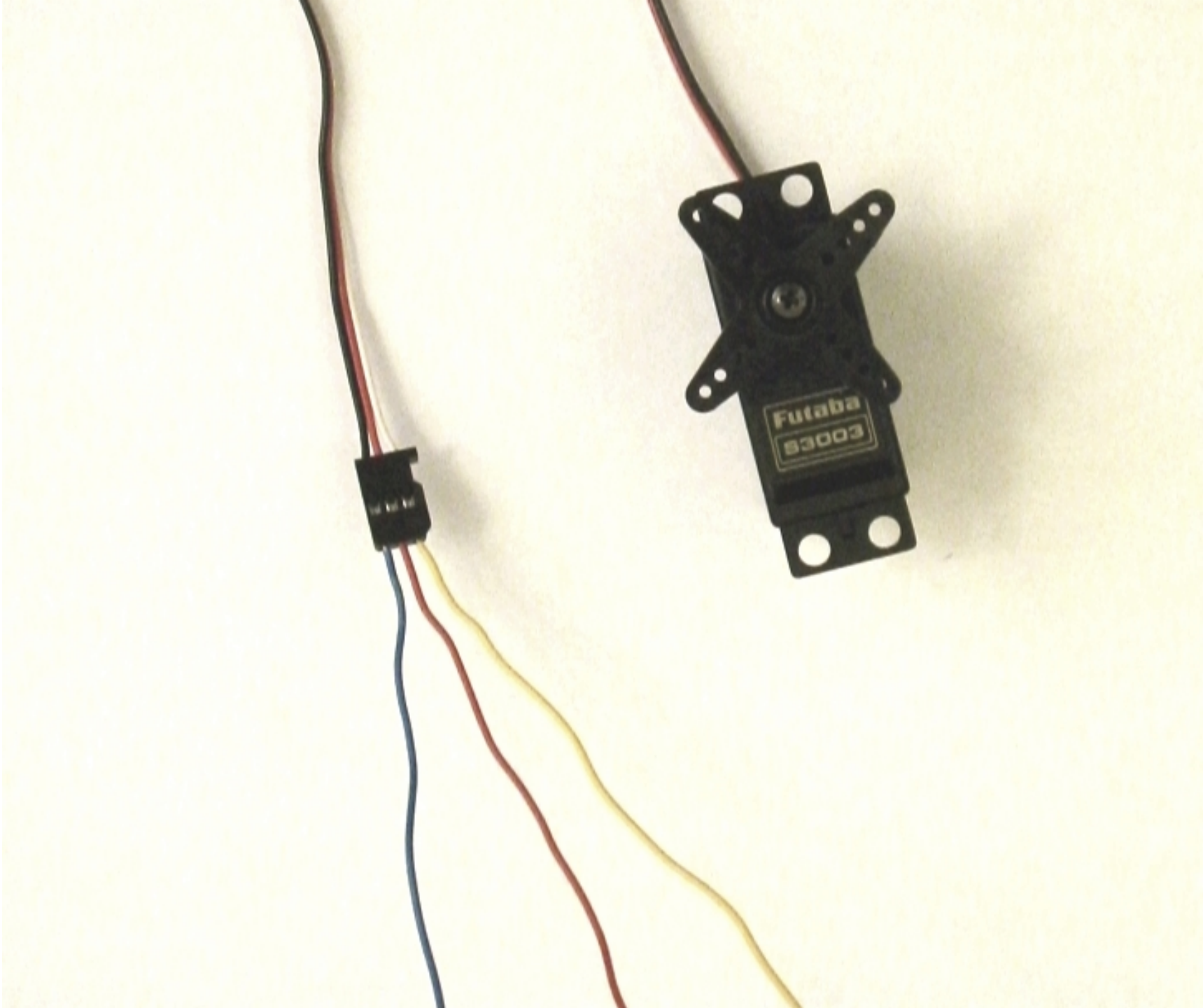
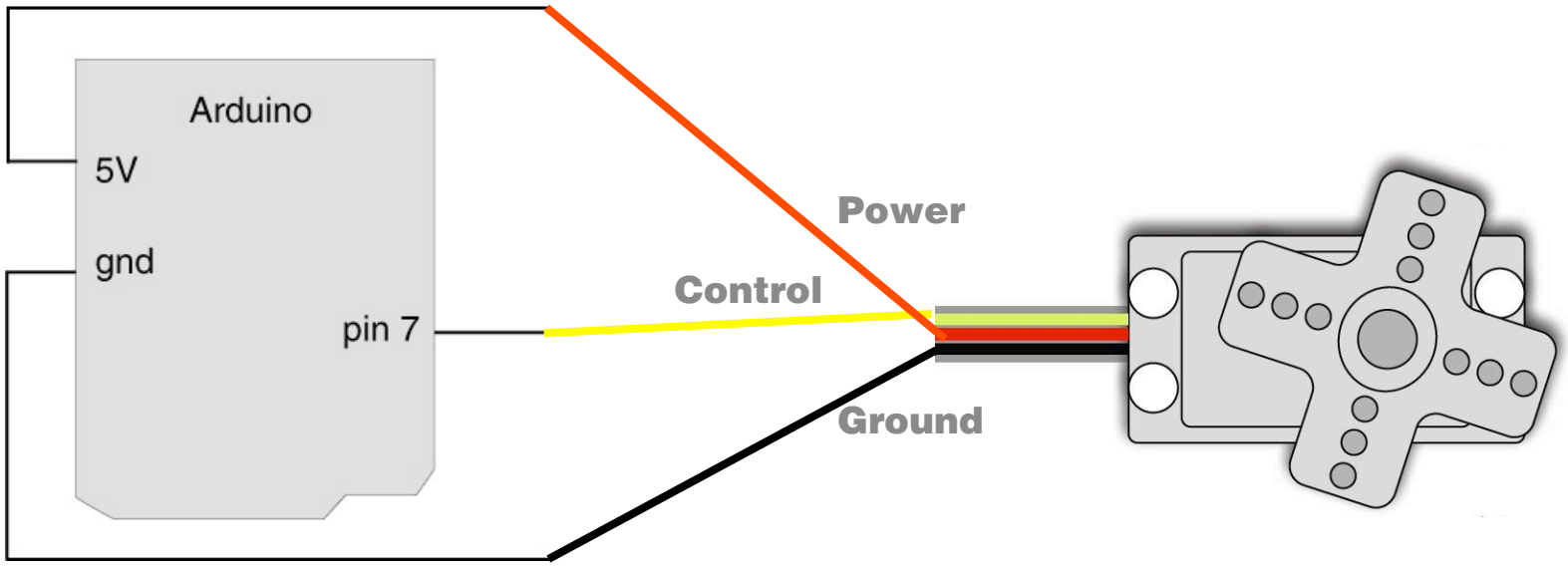
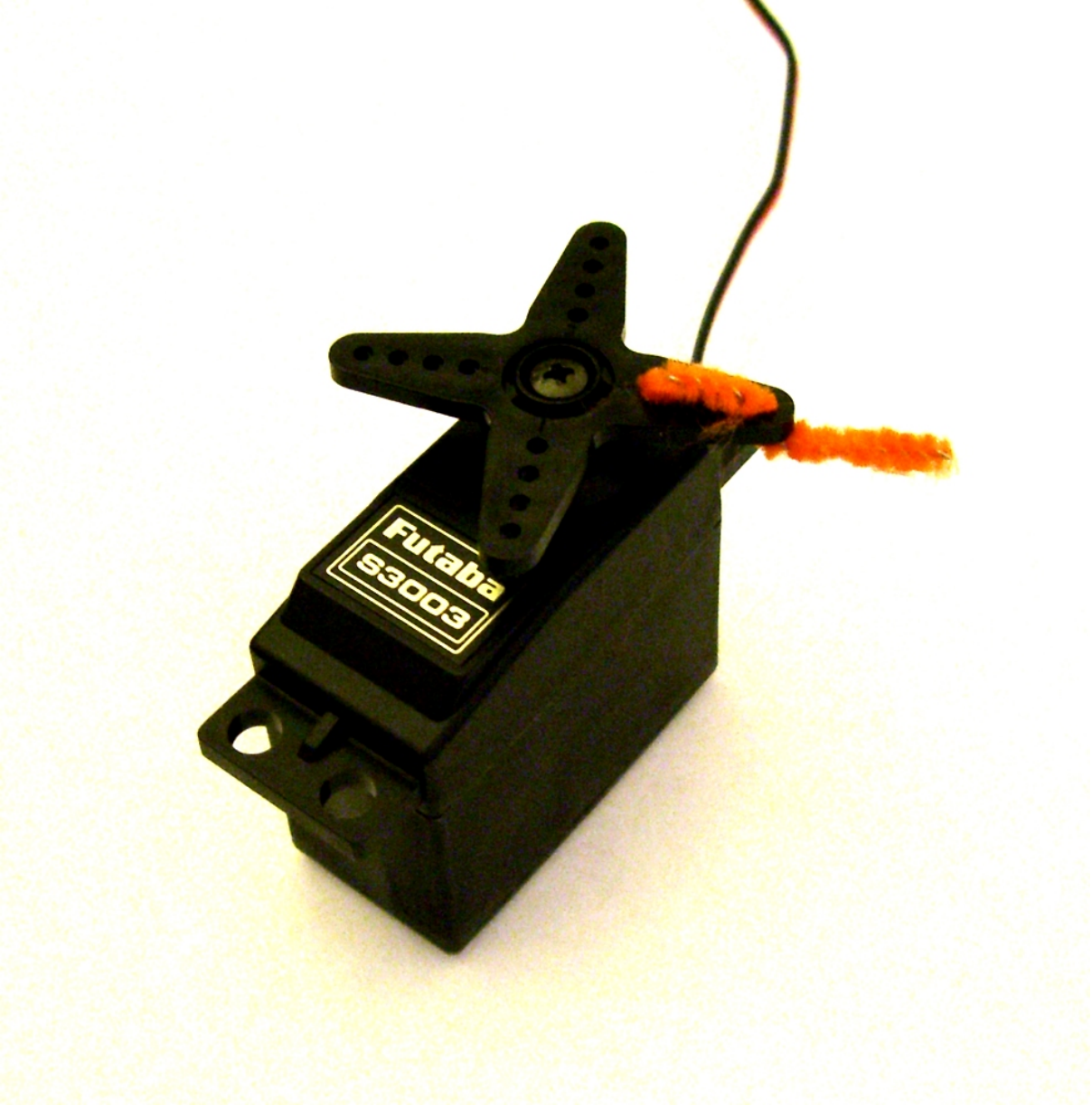


In Class Exercise

1. Connect the servo to Arduino
2. Control the servo via serial communication
3. Control the servo with a pot
4. Make a crawler!


Futaba
S3003


Arduino
5V
gnd
pin 7
Power
Control
Ground


Futaba
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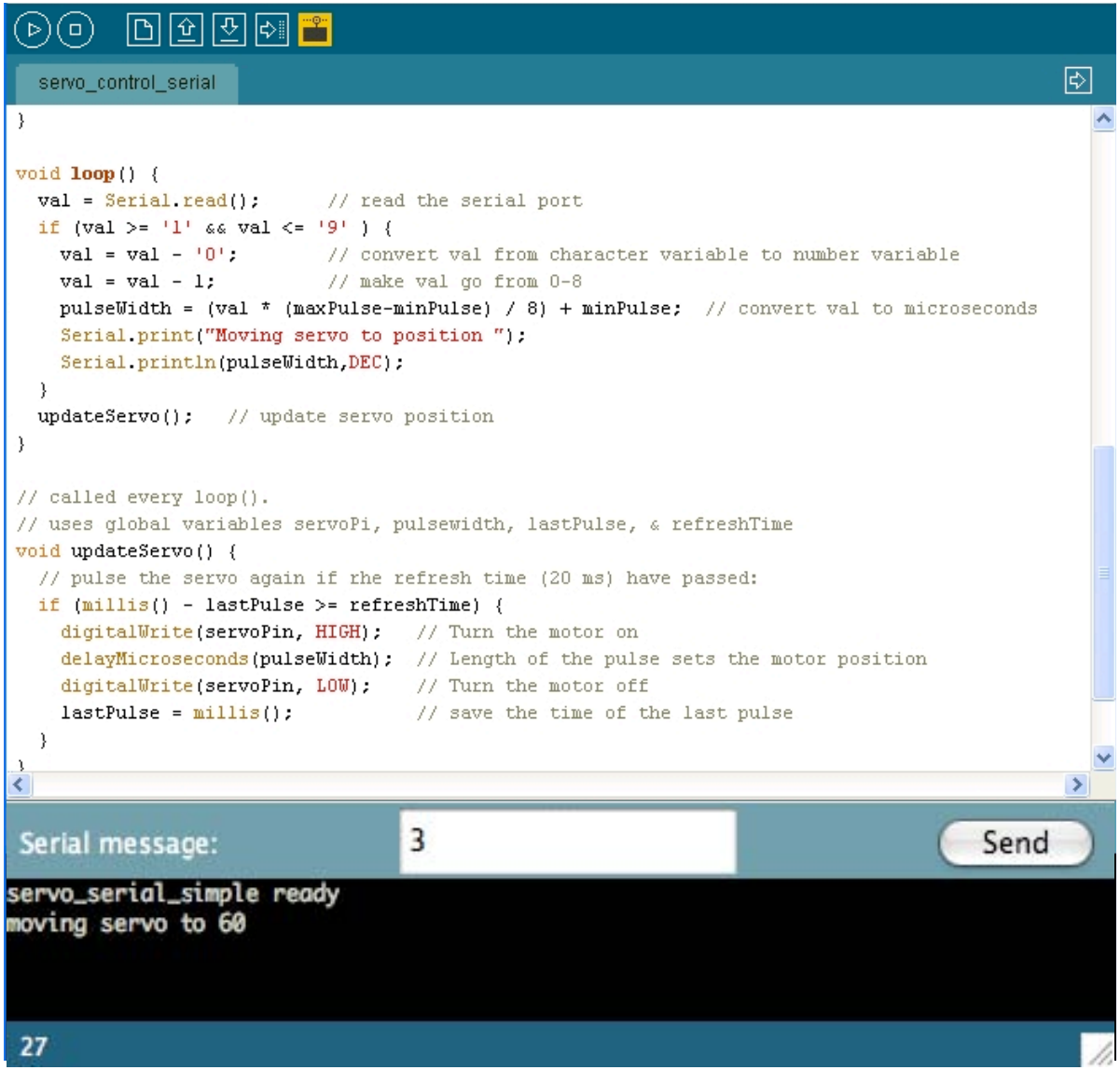
servo_control_serial
}
void loop() {
val = Serial.read(); // read the serial port
if (val >= '1' && val <= '9') {
val = val - '0'; // convert val from character variable to number variable
val = val - 1; // make val go from 0-8
pulseWidth = (val * (maxPulse-minPulse) / 8) + minPulse; // convert val to microseconds
Serial.print("Moving servo to position ");
Serial.println(pulseWidth,DEC);
}
updateServo(); // update servo position
}
// called every loop().
// uses global variables servoPi, pulsewidth, lastPulse, & refreshTime
void updateServo() {
// pulse the servo again if rhe refresh time (20 ms) have passed:
if (millis() - lastPulse >= refreshTime) {
digitalWrite(servoPin, HIGH); // Turn the motor on
delayMicroseconds(pulseWidth); // Length of the pulse sets the motor position
digitalWrite(servoPin, LOW); // Turn the motor off
lastPulse = millis(); // save the time of the last pulse
}
}
Serial message:
3
Send
servo_serial_simple ready
moving servo to 60
27

In Class Exercise

1. Connect the servo to Arduino
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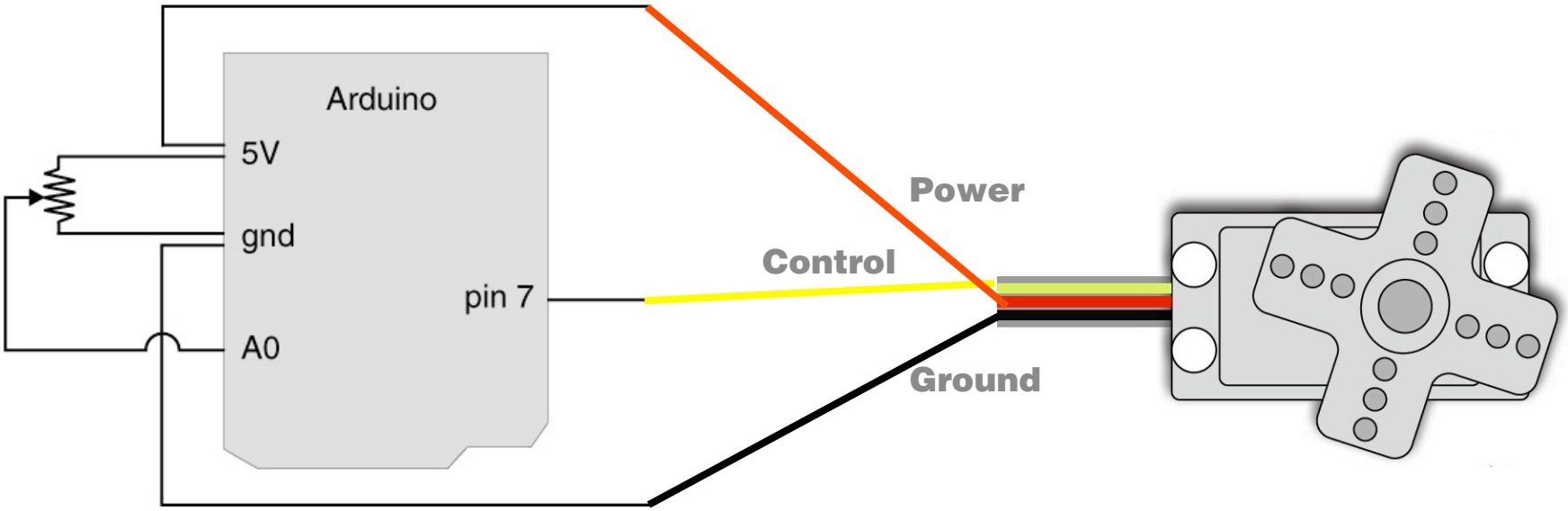
Arduino
5V
gnd
pin 7
A0
Power
Control
Ground

In Class Exercise

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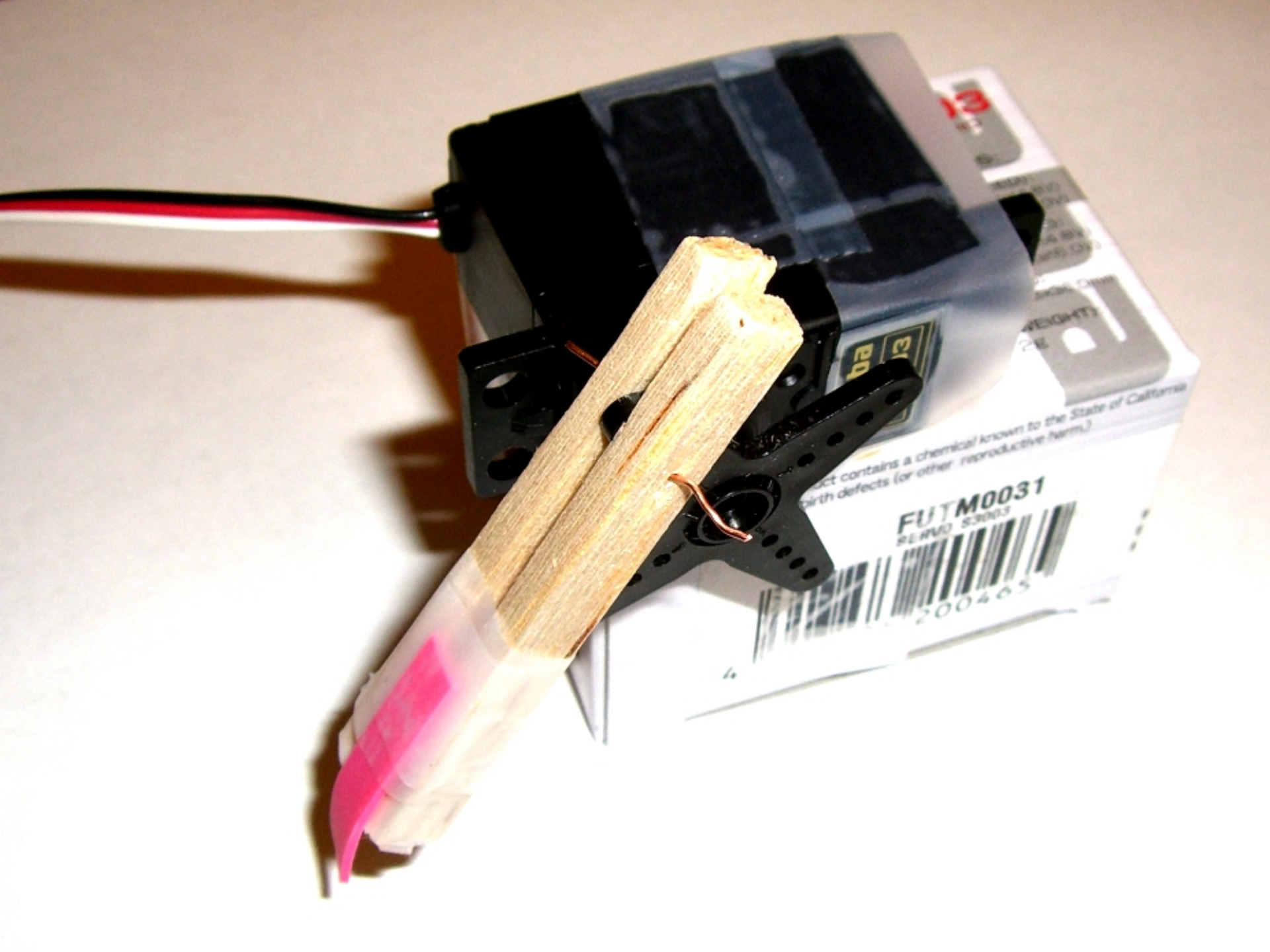
3. Control the servo with a pot
4. **Make a crawler!**


FUTM0031

Assignment

Post descriptions and photo(s) of your crawler on the course website.

Once you get your crawler to move forward, perhaps you would want to generate movement from your program and use your potentiometer to control the speed of the movement. You may also team up with a friend and use two servos instead of one.

Thanks!