

SIT111: Task 3.6P - Servo Motor Control with Arduino

Learning Objective

To understand the basics of servo motor operations and how to interface them with microcontrollers for precise rotational movement control.

Summary - TL; DR

1. Read through the materials on the unit site.
 2. Build and test the Arduino circuit, run experiments.
 3. Submit:
 - Summary and reflection
 - Outcome from activities:
 - Photos, codes, videos of the constructed circuit or experiments
 - Describe any additional insights or knowledge learned during the active learning activities
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Your Task

In this activity, you will learn how to control a servo motor using an Arduino.

Materials Required

- Arduino Uno (or similar Arduino board)
- Servo Motor (e.g., SG90 micro servo motor)
- Breadboard
- Jumper wires
- USB cable to connect the Arduino to a computer
- Arduino IDE installed on the computer

Circuit Assembly:

- Connect the servo motor's power line (usually red) to the Arduino's 5V pin.
- Connect the ground line (usually brown or black) to one of the Arduino's GND pins.
- Connect the control line (usually orange or yellow) to a digital pin on the Arduino (e.g., pin 9).

Programming:

- Include the Servo library in your Arduino sketch.
- Create a Servo object and attach it to the control pin.

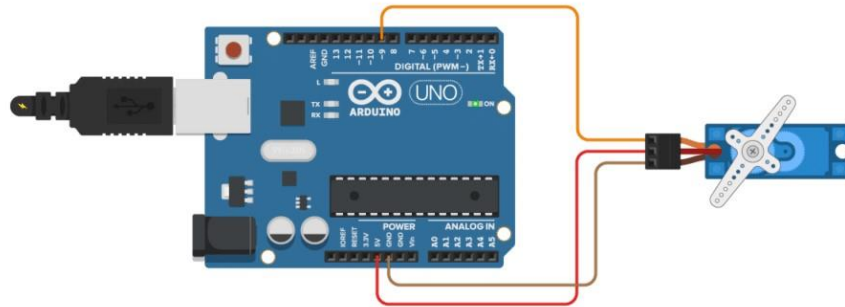


Figure 1: Sample Circuit

- Write a function in the loop() to rotate the servo to various angles based on the given comments

// Include the servo library: #include "Servo.h"

// Create a new servo object: Servo
myservo;

// Define the servo pin: #define
servoPin 9

void setup() {
 // Attach the Servo variable to a pin: myservo.attach(servoPin);
}

void loop() {
 // Example: Tell the servo to go to a 45 degree angle:
 myservo.write(45); delay(1000);

 // Task 1: Tell the servo to go to a 90 degree angle,
 // 135 degrees, then 180 degrees before going back to // its original
 position (0 degrees). // Wait 1 second between each angle.

 // Task 2: Write a loop to tell the servo to slowly

 // sweep to 180 degrees, then back to 0 degrees // (use a delay
 to slow down the sweep)
}

```
    delay(1000);  
}
```

Uploading and Testing:

- Connect the Arduino to the computer using the USB cable.
 - Use the Arduino IDE to upload your sketch to the board.
 - Observe how the servo motor rotates in response to the programmed instructions.
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Prepare Your Submission

Once you feel confident that you have achieved the learning goals, you can prepare a submission to demonstrate this. This will contain three sections: summary of what you learnt, reflection on your learning, and evidence of study and practice.

Section 1: Summary

Summarise what you have done and what you have learnt from the experiment. This should be a personal summary, written so that it will be useful to you should you need to quickly revise these concepts and tools in the future. Capture the most important aspects from the materials in the unit site and anything else you find related to this topic.

Section 2: Reflection

Reflect on your learning by responding to the following prompts:

- How do you know you have achieved the learning goals?
- What is the most important thing you learned from this and why?
- How does the content or skills learned here relate to things you already know?
- Where or when do you think it will be useful?

Note:: The content for the first two sections should not exceed 500 words or 1 printed page.

Section 3: Evidence of study and practice

This section will contain evidence of your outputs from the learning activities for this task:

- Screenshot of the Arduino IDE successfully uploading the code
- Your code

- A short video of the working hardware (YouTube or Panopto)

Upload Your Submission

Once you have all the evidence in place, login to CICRA VLE and mark the task as **Ready for Feedback**. The submission process will ask you to upload evidence of completion of the task. For quizzes, please include a screenshot showing your quiz score. For Active Learning Session problems, you must submit evidence that you yourself had completed the activities. While working in groups/pairs is welcome, you must have evidence of your own contributions.

The system will also ask you to reflect on what unit learning outcomes have been achieved by this task.

Engage with Feedback

To get the task marked as **Complete**, you need to engage with the feedback you receive. Your tutor will review your submission and may ask you to clarify aspects of your learning, redo parts of the task, or include aspects you have missed. You may be asked to discuss the task in class or online. Use these discussions as an opportunity to help develop and validate your understanding.

If you are asked to resubmit, *make sure your subsequent submission includes a comment that describes how you have addressed the feedback you received*. This needs to demonstrate how you have addressed all the aspects indicated by your tutor in their feedback on your learning.