


# Feedback control system for robotic arms



By Mojahed Nour– July 27, 2020



# CONTENT

## FEEDBACK CONTROL SYSTEMS

**01** *Definition*

**02** *AIM*

**03** *Technique & Flowchart*

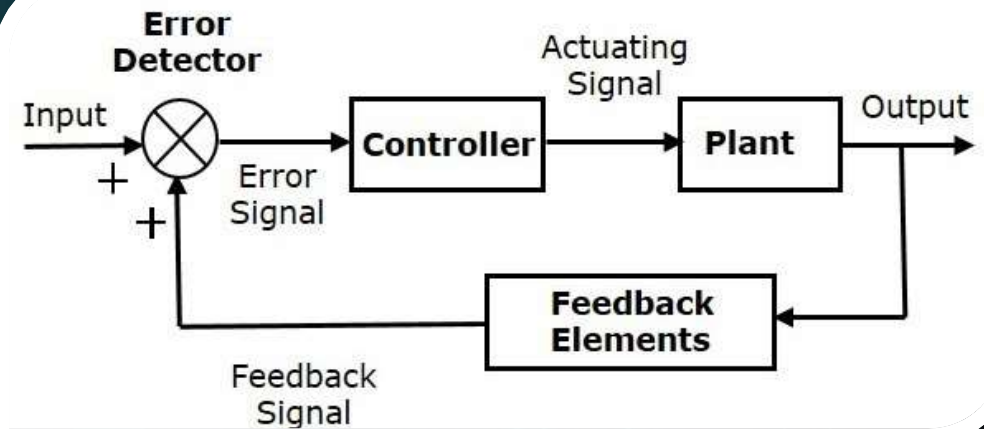
**04** *Implementation*

# 01

## Feedback control system

A feedback control system :

a **system** whose output is controlled using its measurement as a **feedback** signal. This **feedback** signal is compared with a reference signal to generate an error signal which is filtered by a **controller** to produce the **system's control** input.





## 02

# THE AIM

The purpose of the **feedback control system** :

Development of a feedback system that will send the controller a signal once the arm is moved manually, the other arm should move simultaneously with the same degree using the feedback control system.

## 03

# The technique

The mechanism of the **feedback control system** :

To perform this task , a simulation software should be used to design and program the circuit of the feedback signal .  
In the circuit, Arduino might be used as a microcontroller and two servo motors linked by Arduino to reflect the arms of the robot.

The variable resistance of the servo motor(arm) should be determined and based on its measurement ,the other motor should be able to rotate by the microcontroller with the same degree .

To reflect its internal resistance ,one servo motor should be replaced with a potentiometer. The other servo motor will rotate with the same degree, as the resistance varies using the potentiometer (as the arm is adjusted manually).

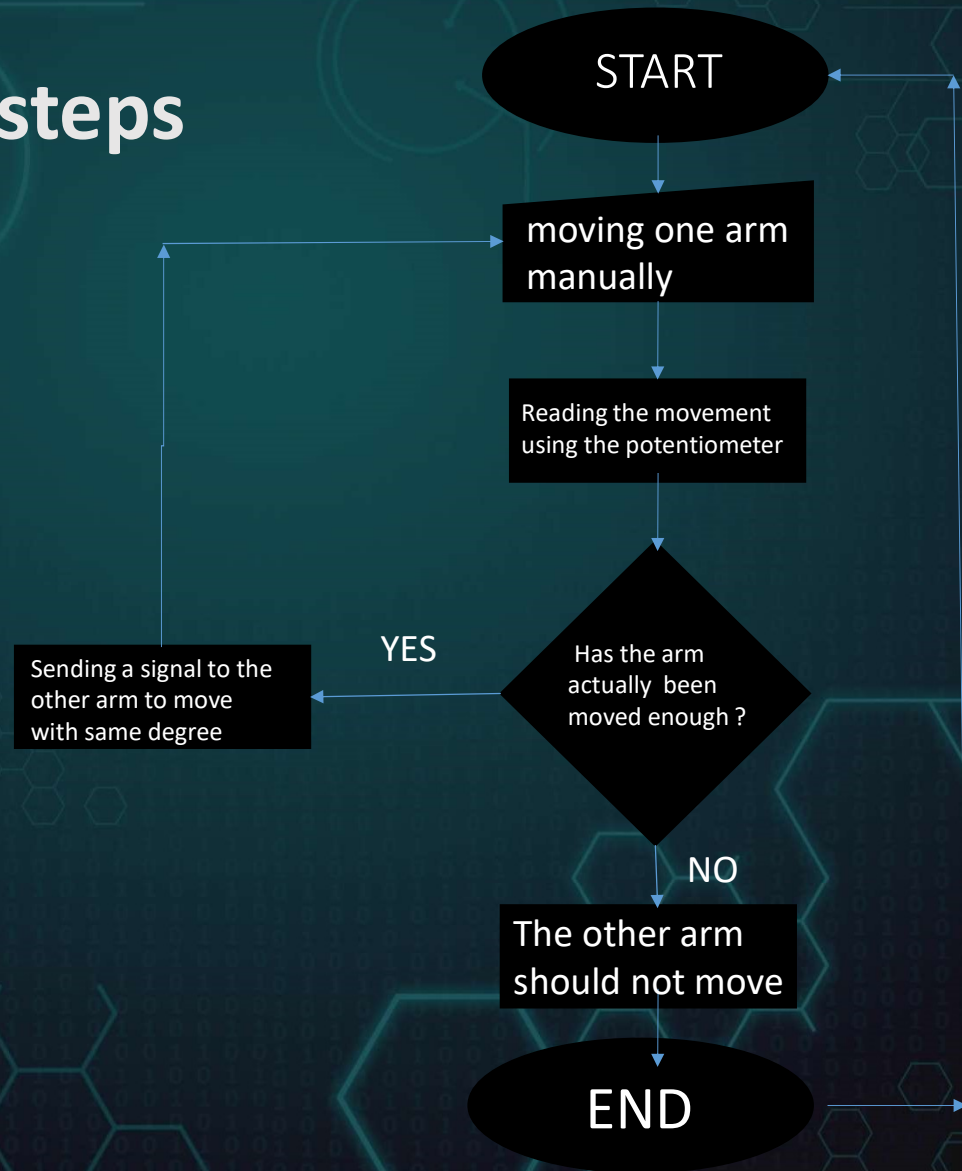
The flowchart & code will clarify this technique further..

## 03

# Feedback system steps

### Flowchart:

A diagram that represents a workflow or an algorithm of **feedback control system for robotic arms**





# 04 Feedback system implementation

The code :

```
#include <Servo.h> //include servo library

int feedback-measurement = 0, movement = 0; // feedbackmeasurement =the measurement from the potentiometer
// movement= to transfer the measument to the other arm

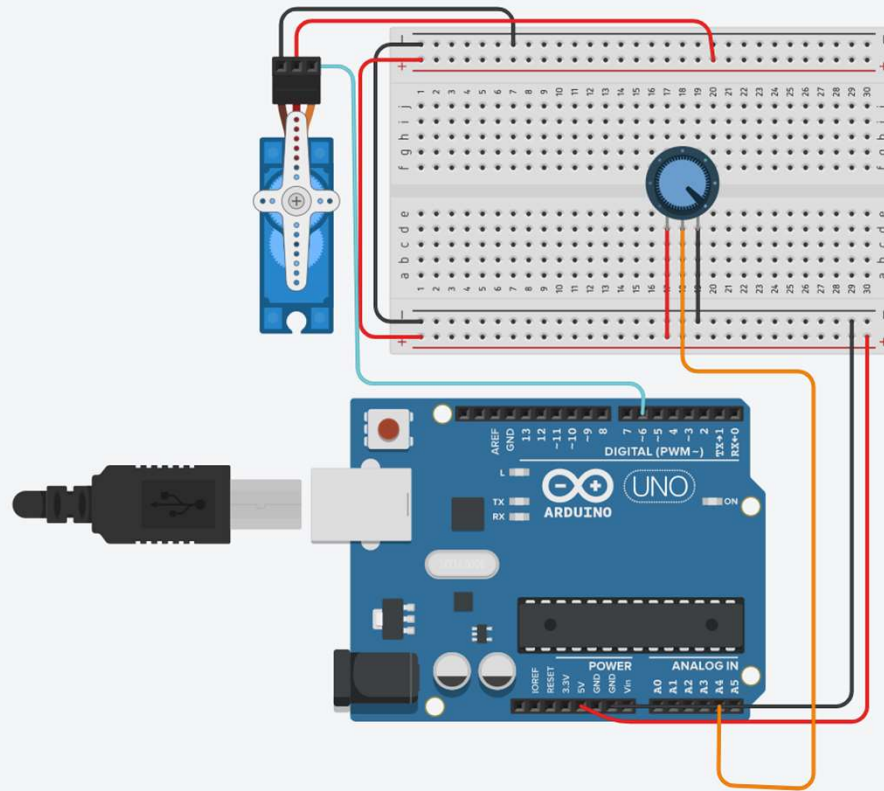
Servo servo_;

void setup()
{
  pinMode(A4, INPUT); //feedback signal as an input
  servo_.attach(6);
}

void loop()
{
  feedbackmeasurement = analogRead(A4);
  movement = map(feedbackmeasurement, 0, 1023, 0, 180);
  servo_.write(movement); //transfer the rotation to the second arm
  delay(5);
}
```

# 04 Feedback system implementation

The circuit design :







THANK YOU

