The background is a textured, light brown surface. It is decorated with stylized mechanical elements: large grey gears in the top-left and bottom-right corners, and a network of brown and orange pipes with various sized gears (black, orange, and grey) integrated into the design on the left and right sides.

# ROBOTIC ARM

**SECOND SEMESTER PROJECT**

REQUIREMENT OF ENGG 102

# GROUP MEMBERS



**Anusandhan Tripathi**



**Samyam Shrestha**



**Romanch Nyaupane**



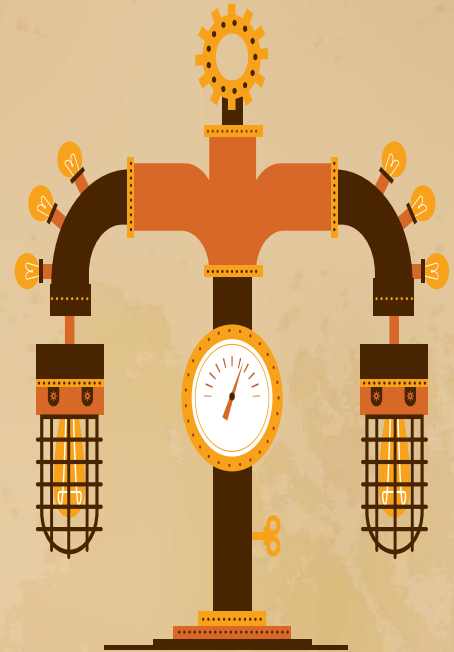
**Ashim Gautam**



**Saugat Karki**



**Anupam Koirala**



The background is a textured, light brown surface. In the top-left corner, there is a dark brown pipe that curves downwards and then to the right. In the top-right corner, there are several interlocking gears in shades of grey and orange. In the bottom-left corner, there are more gears, some in yellow and some in orange. In the bottom-right corner, there is a yellow pipe that curves upwards and then to the right, with a grey speaker icon and sound waves next to it.

**01**

**INTRODUCTION**

**02**

**METHODOLOGY**

**03**

**RESULT**

**04**

**CONCLUSION**

The background is a textured, light brown surface. On the left, there are vertical brown lines representing pipes, with orange T-junctions and elbows. A small orange gauge is attached to one of the pipes. Several gears of different sizes and colors (orange, grey, and yellow) are scattered across the background, some partially obscured by the pipes and text.

# 01

## **INTRODUCTION AND BACKGROUND**

# BACKGROUND OF ROBOTS & ROBOTIC ARM

Utilization of robots in workspace and industries help in improving safety standards and efficiency of robots.

- Robotic arm is also a type of robot.
- Mechanical and often programmable.
- Functionality of a human arm and much more.

# OBJECTIVES AND APPLICATIONS



## OBJECTIVES

- Design user-controllable robotic arm
- Avoid use of microcontrollers.
- Pick and place object of 20 grams

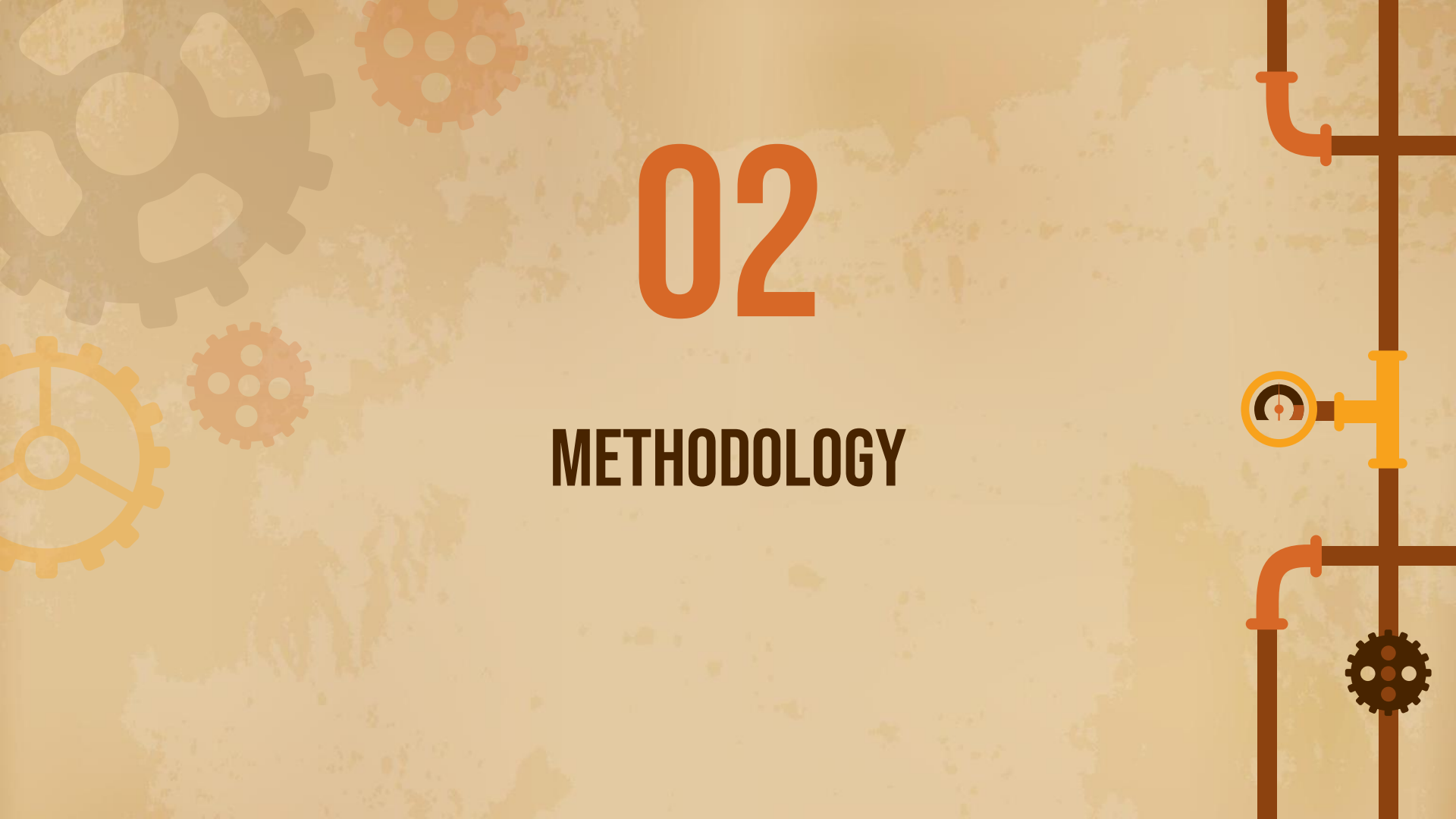


## APPLICATION

- To prevent ergonomic concerns.
- Hands on model to learn about components.

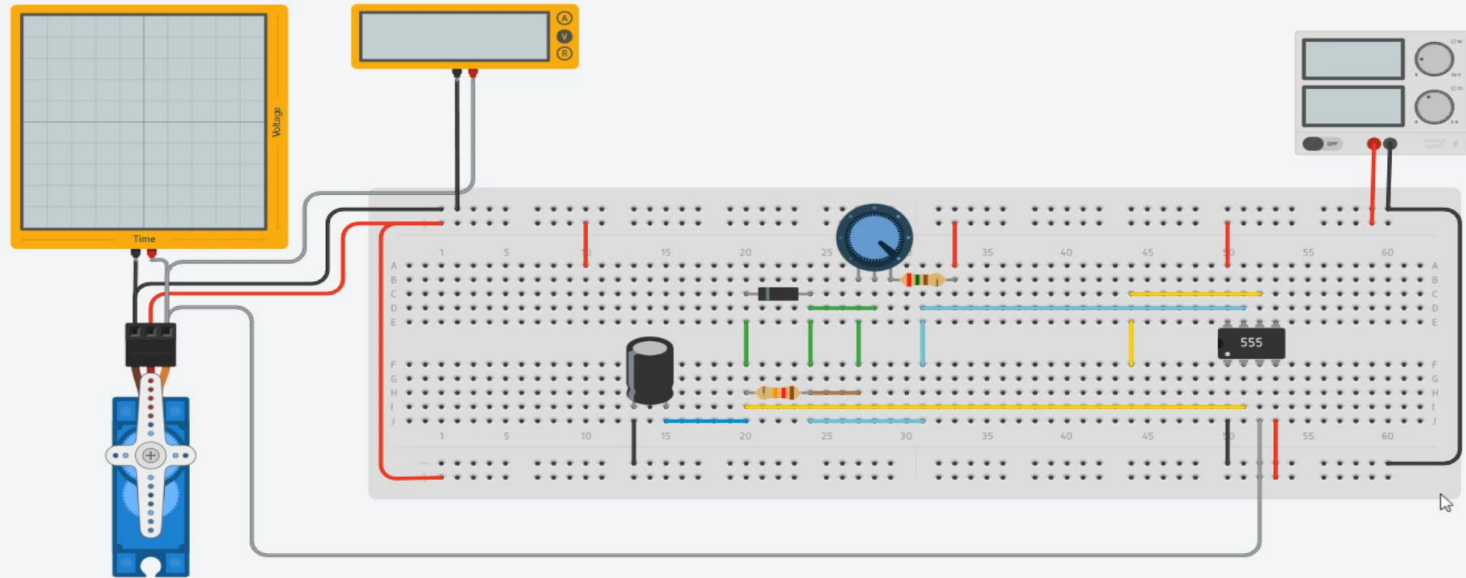
# 02

## METHODOLOGY



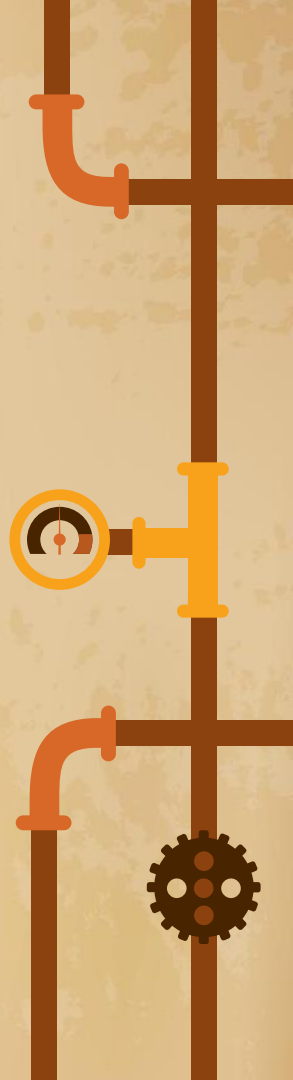
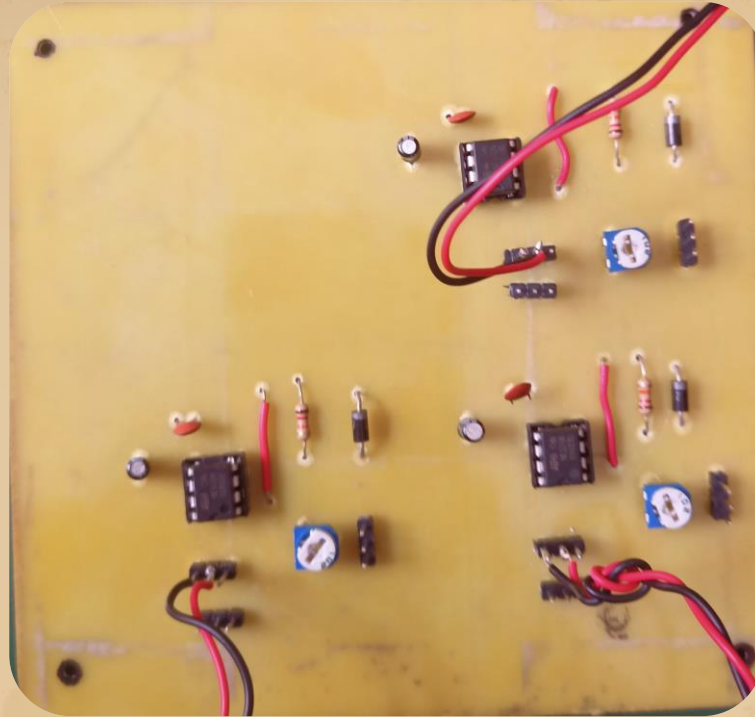


# CIRCUIT ON BREADBOARD





# SERVO MOTOR CIRCUIT



# COMPONENTS

RESISTOR



CAPACITOR



555 TIMER IC



SERVO MOTOR



POTENTIOMETER



DIODE



# COMPONENTS

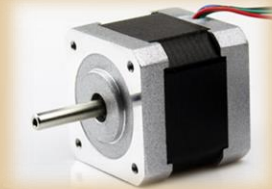
DRV 8825 MOTOR DRIVER CONTROLLER



GLOSSY PAPER



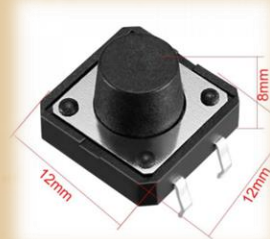
STEPPER MOTOR



JUMPER WIRES



3 WAY SWITCH



# SYSTEM OVERVIEW

## User Input

Dummy arm with  
potentiometer at joints



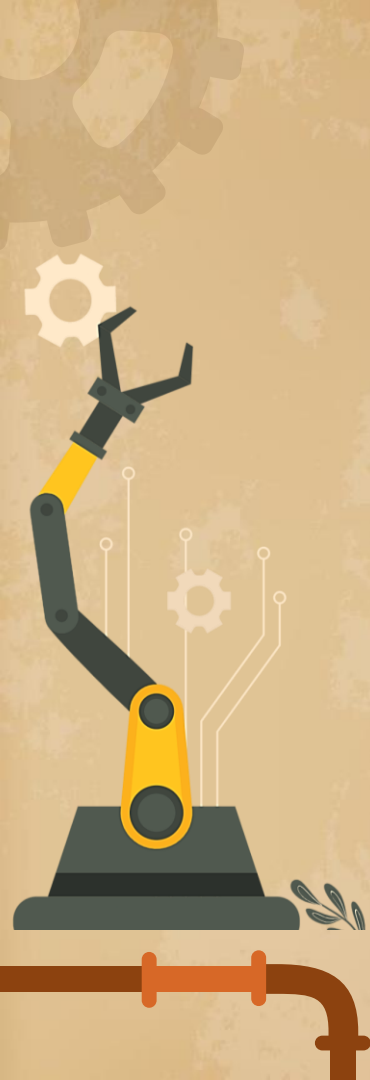
## Control Input

Signal Generator built using array  
of 555 timers



## Actuators

Servo Motors at the joints  
responsible for moving the arm.



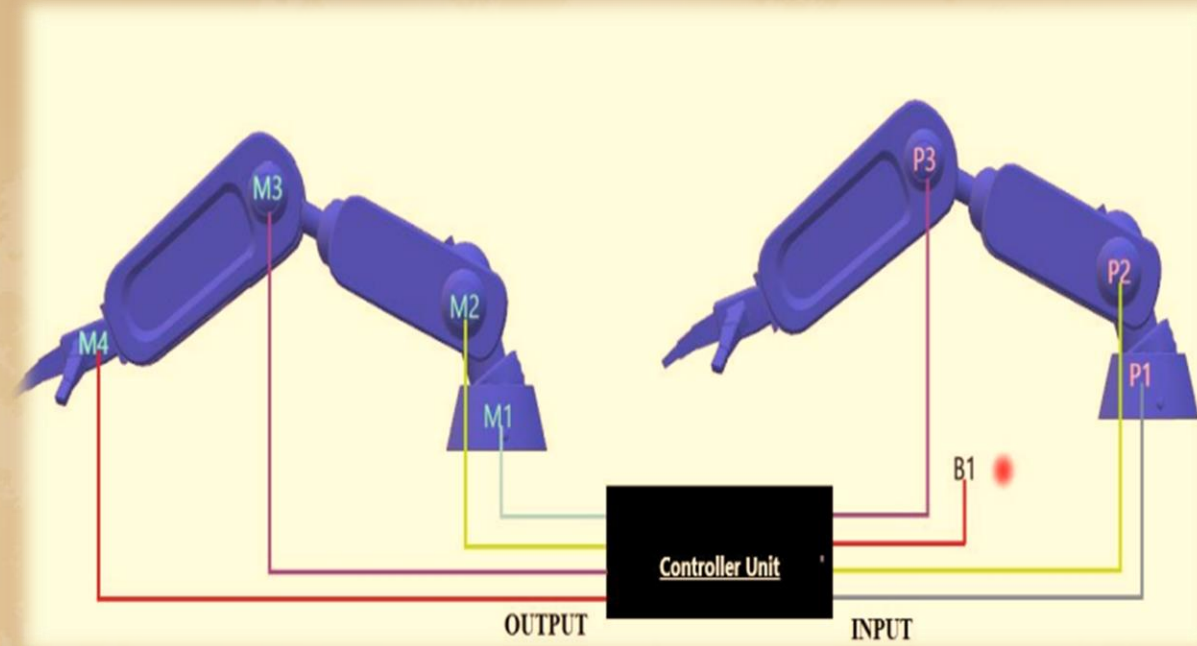
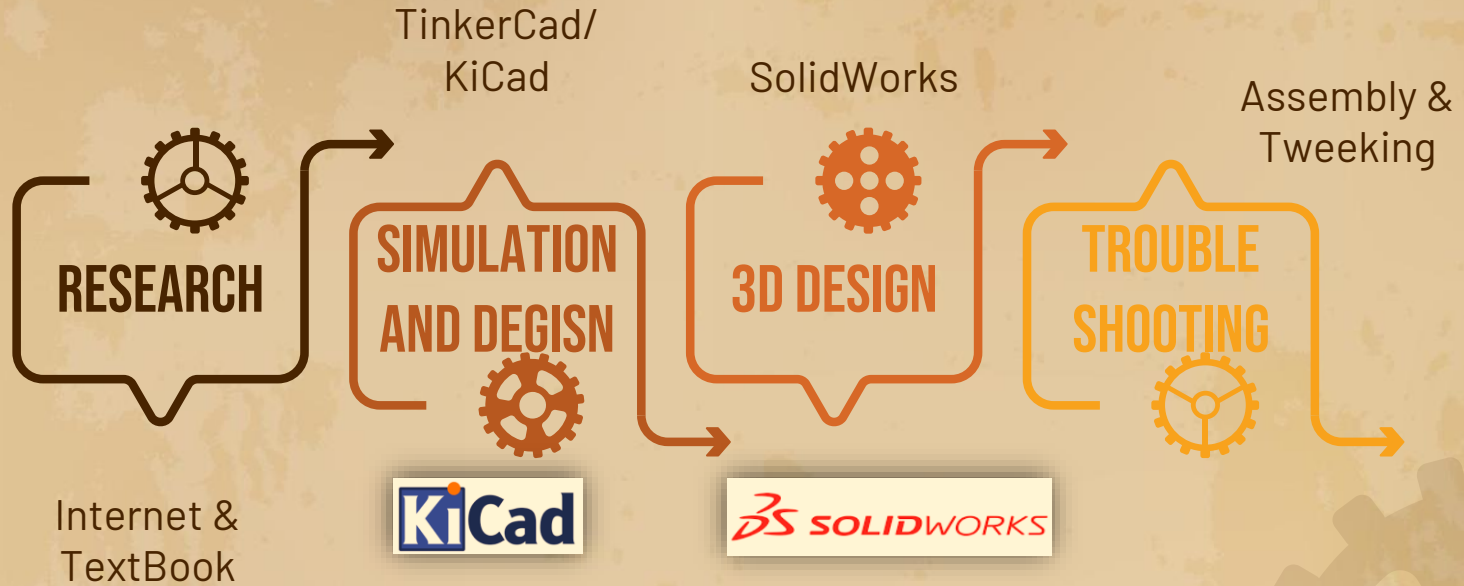


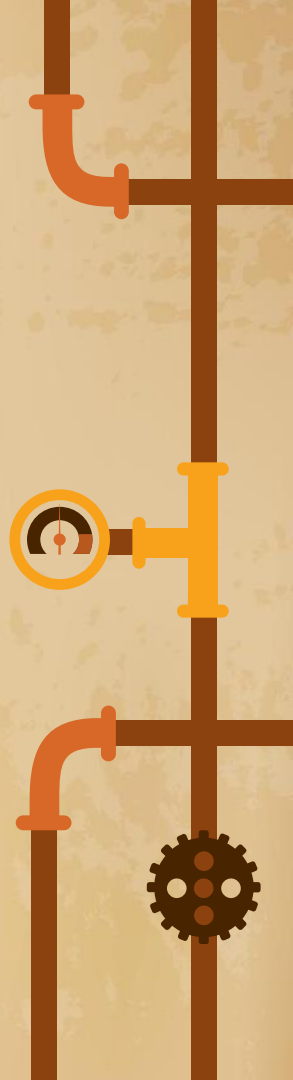
Fig 1: Illustrative model of robotic arm

# METHOD





# STEPPER MOTOR CIRCUIT





The background is a textured, light beige surface. On the left side, there are several gears of different sizes and colors (brown, orange, and yellow). On the right side, there is a vertical pipe with various fittings, including a yellow T-junction, a pressure gauge, and a small gear at the bottom.

# 03

## RESULTS

# RESULT

- Lift 20 grams of weight
- Dummy arm as input
- Two Degrees of Freedom i.e., XY- plane and XZ- plane
- Portable and mobile

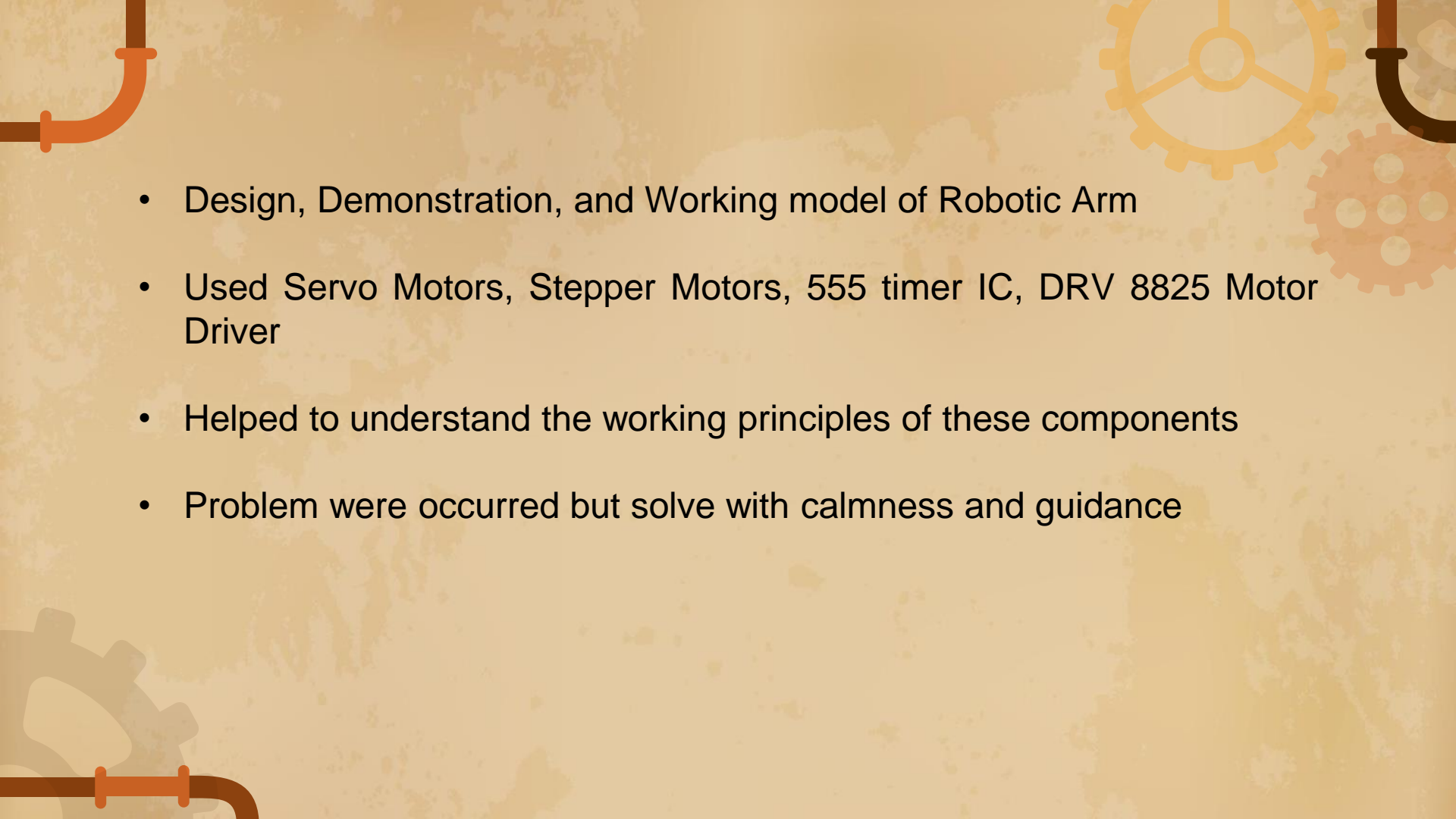
# PROBLEM ANALYSIS

- Vibration of Servo Motors due to noise
- Short Circuit of DRV 8825 Motor Driver
- Kept separate power supply for each servo motors
- Motor driver handled with care.
- Soldering of the PCB done carefully.

The background is a textured, light beige surface. On the left side, there are several gears of different sizes and colors (dark grey, orange, and yellow). On the right side, there is a vertical pipe system with horizontal branches, featuring a yellow valve and a small circular gauge. A small gear is also attached to the bottom of the pipe system.

# 04

## CONCLUSION

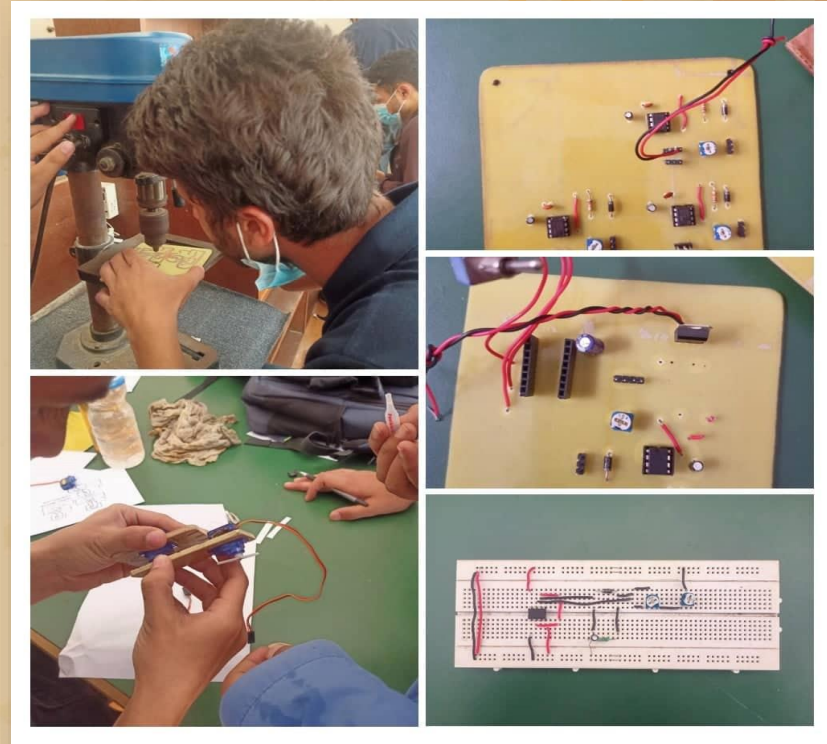
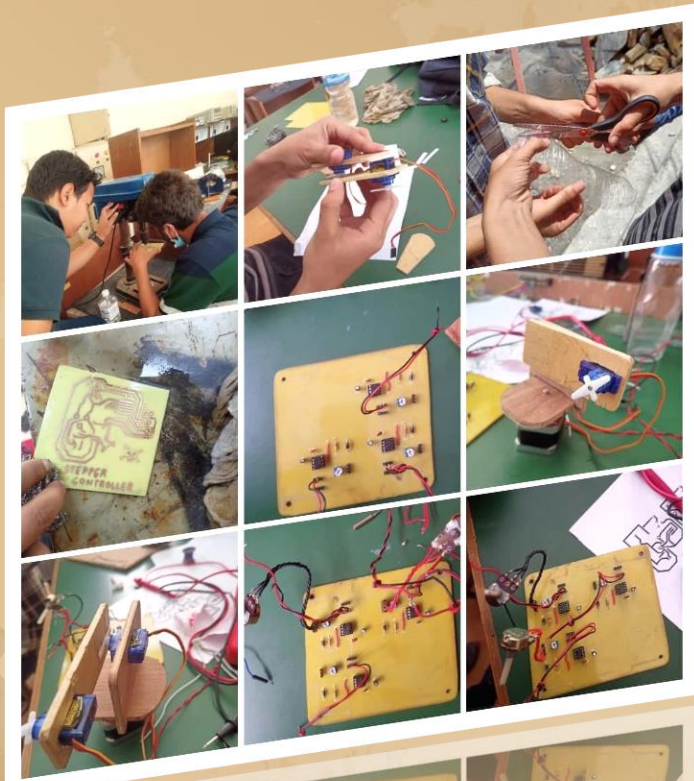
- 
- Design, Demonstration, and Working model of Robotic Arm
  - Used Servo Motors, Stepper Motors, 555 timer IC, DRV 8825 Motor Driver
  - Helped to understand the working principles of these components
  - Problem were occurred but solve with calmness and guidance

# REFERENCES

- [1] <https://www.intuitive.com/en-us/products-and-services/da-vinci>
- [2] <https://stanforddaily.com/2020/06/21/complexity-theory-amazons-mechanical-turk-is-a-disaster-for-crowdworkers/>
- [3] <https://robots.ieee.org/>
- [4] [Intuitive - da Vinci - Robotic Surgical Systems](#)



# OUR PROJECT ACTIVITIES IN A GLANCE





The background is a textured, light brown surface. It is decorated with various mechanical elements: large and small gears in shades of brown and orange, and a network of pipes in dark brown and yellow. Some pipes have valves and elbows. The overall aesthetic is steampunk or industrial.

# THANKS!

## Do you have any questions?

CREDITS: This presentation template was created by  
**Slidesgo**, including icons by **Flaticon**, infographics &  
images by **Freepik** and illustrations by **Stories**