ROBOTIC ARM

SECOND SEMESTER PROJECT

REQUIREMENT OF ENGG 102

GROUP MEMBERS

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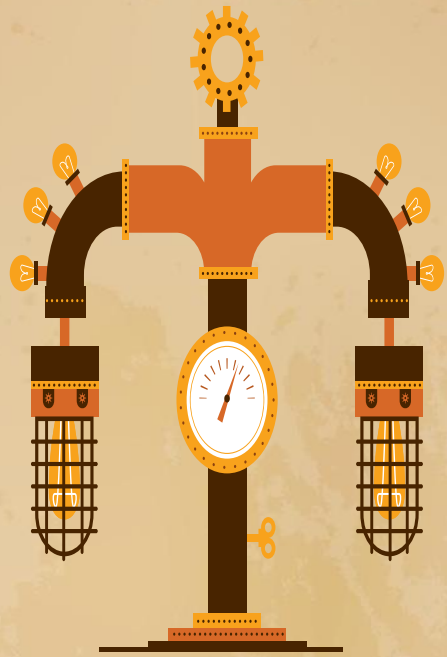


01

INTRODUCTION

02

METHODOLOGY

03

RESULT

04

CONCLUSION

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

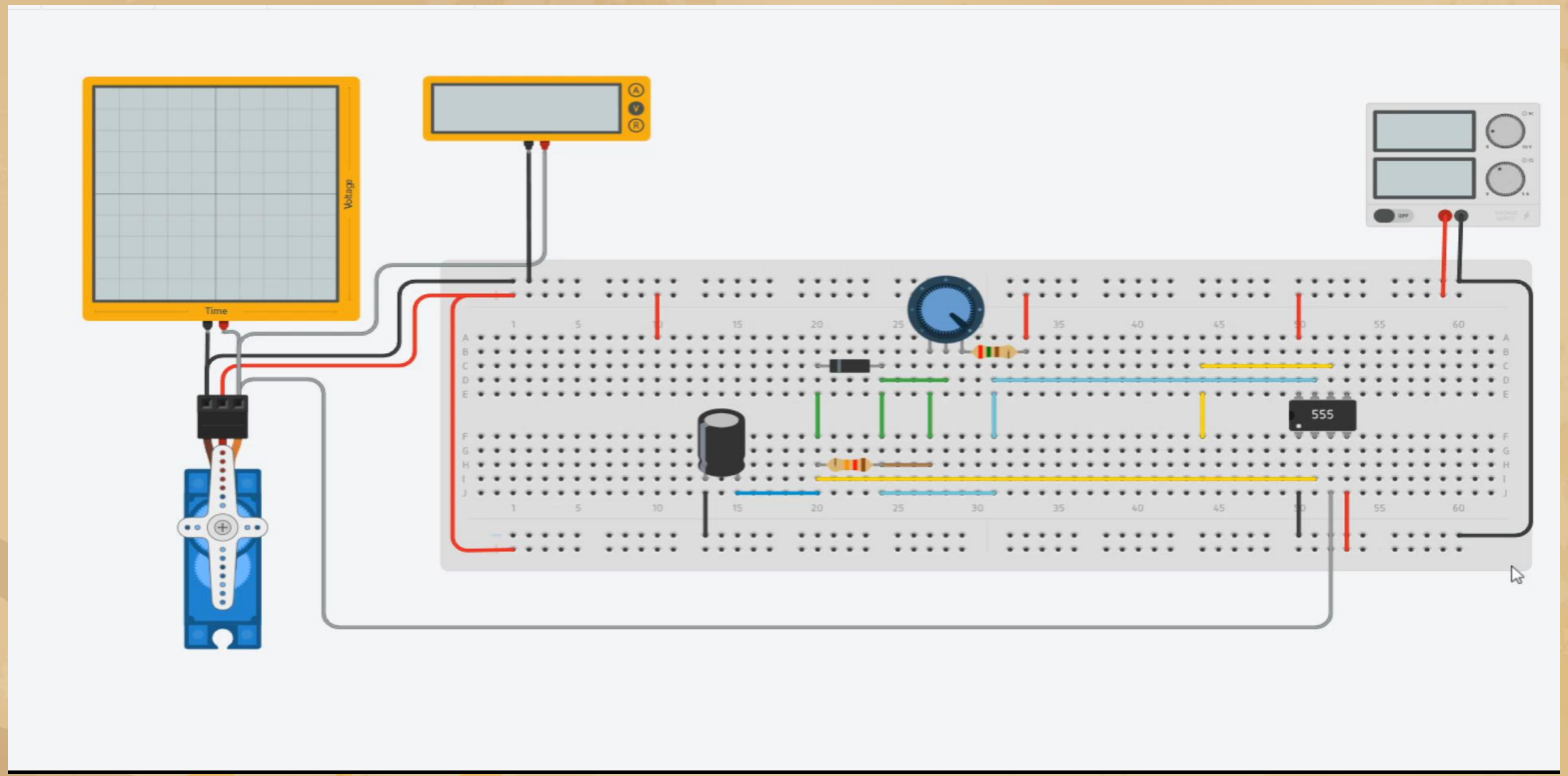
APPLICATION

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

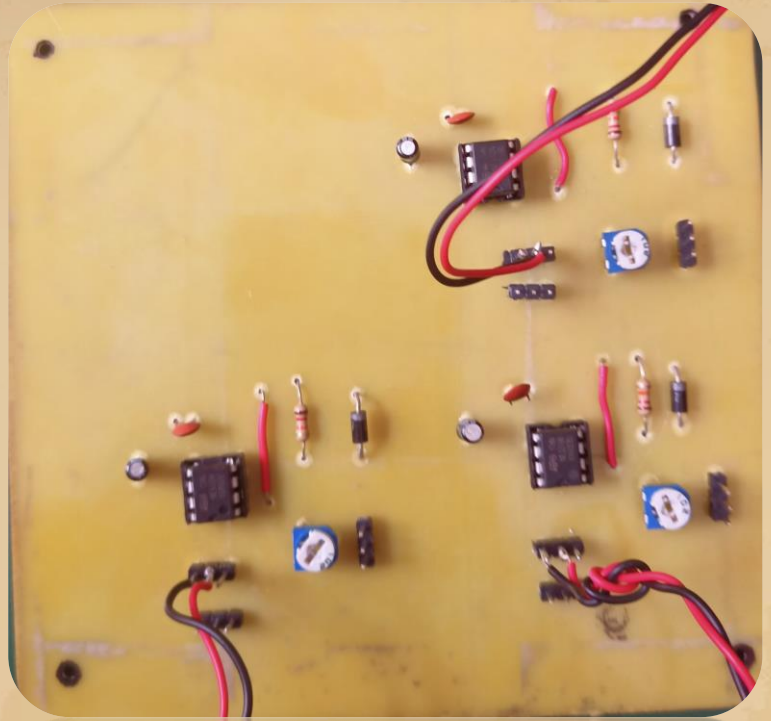
02

METHODOLOGY

CIRCUIT ON BREADBOARD

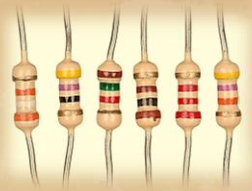


SERVO MOTOR CIRCUIT



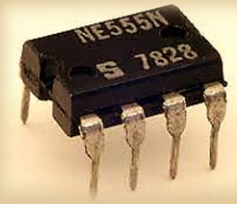
COMPONENTS

RESISTOR



CAPACITOR

555 TIMER IC



SERVO MOTOR

POTENTIOMETER

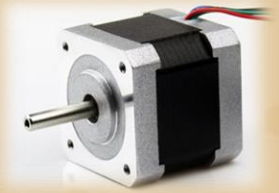
DIODE

COMPONENTS

DRV 8825 MOTOR DRIVER CONTROLLER

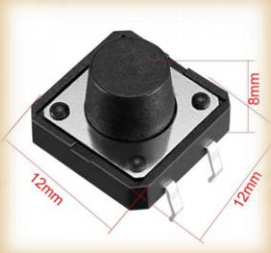
GLOSSY PAPER

STEPPER MOTOR

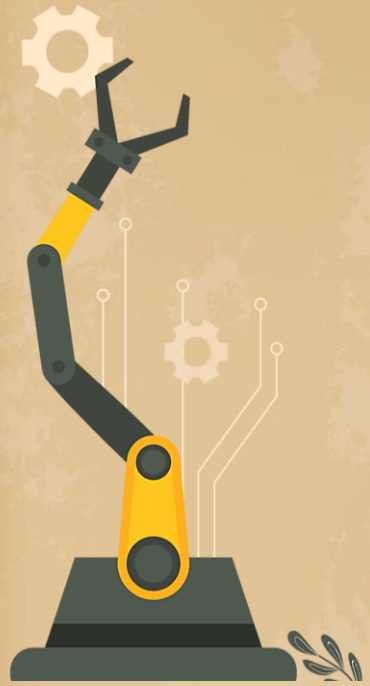


JUMPER WIRES

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.

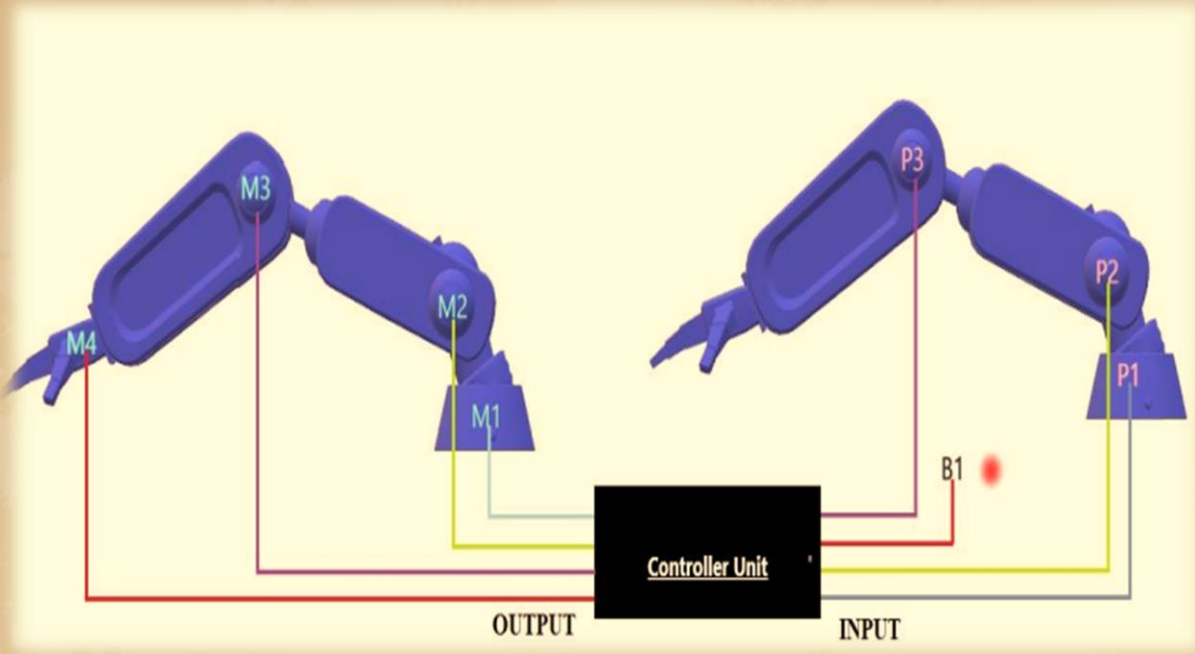
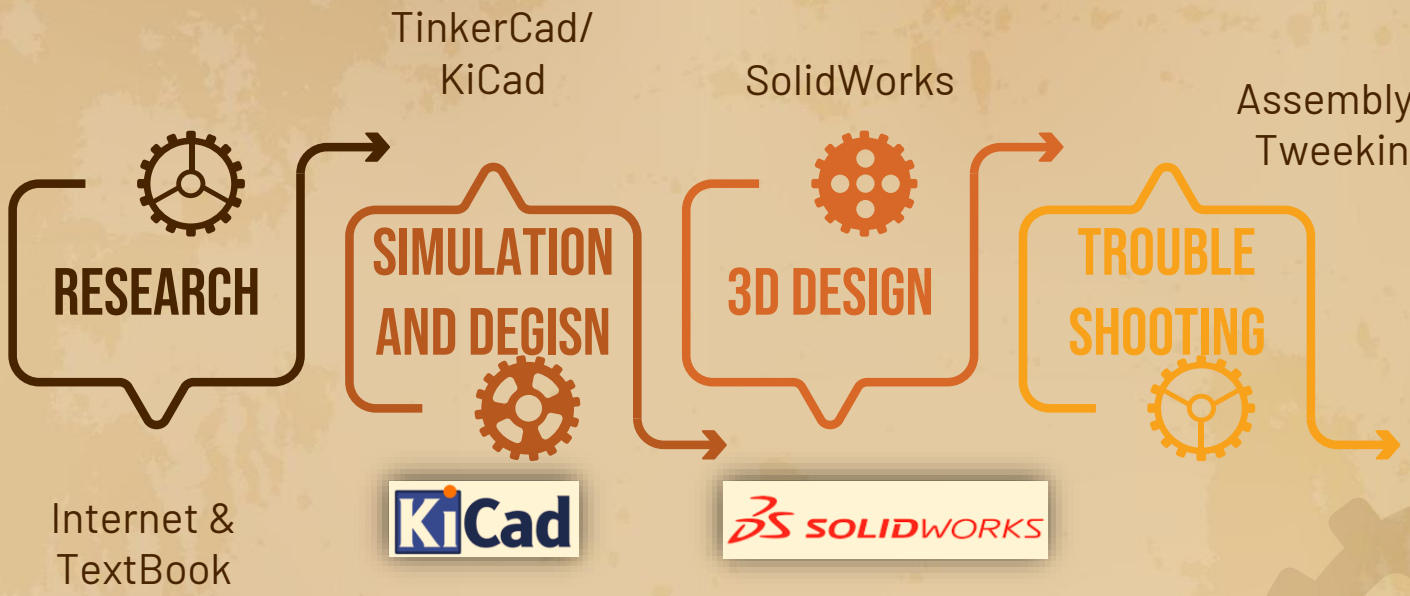


Fig 1: Illustrative model of robotic arm

METHOD


RESEARCH
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KiCad
SolidWorks
3D DESIGN
SOLIDWORKS
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SHOOTING
Assembly &
Tweeking

STEPPER MOTOR CIRCUIT

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.

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

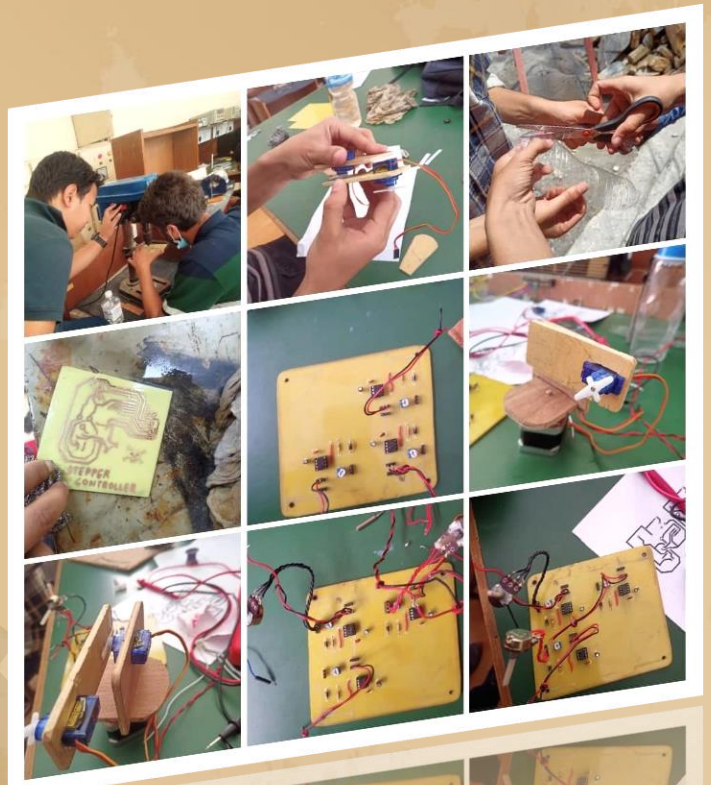
[1] https://www.intuitive.com/en-us/products-and-services/da-vinci

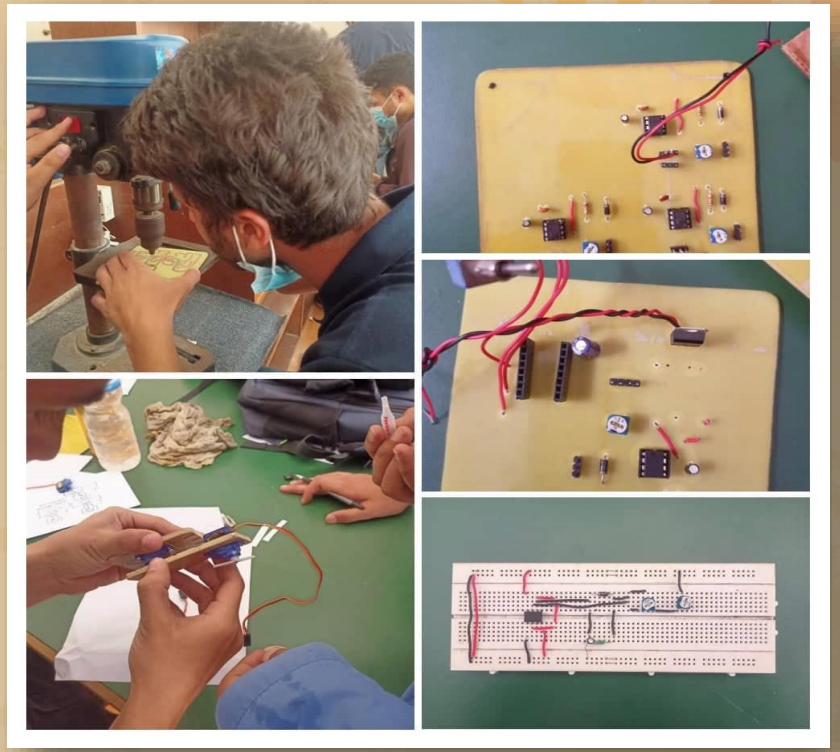
[2] https://stanforddaily.com/2020/06/21/complexity-theory-amazons-mechanical-turk-is-a-disaster-for-crowdworkers/

[3] https://robots.ieee.org/

[4] Intuitive - da Vinci - Robotic Surgical Systems

OUR PROJECT ACTIVITIES IN A GLANCE





THANKS!

Do you have any questions?