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Centre For Engineering Education Research

PRAYOG VARSH 2023

Team No-G2

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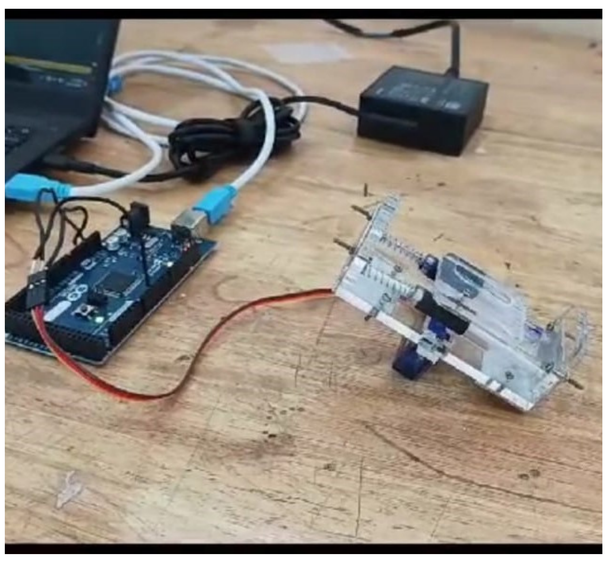
Title: Industrial Robot

Problem Definition:

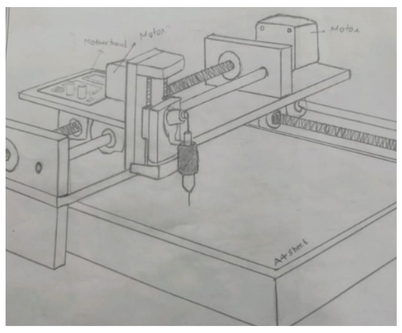
Design a semi-automatic ,lightweight, efficient, aesthetically pleasing, economical, eco-friendly, portable, easy to use bot that should be compact within the dimensions 2ftx2ftx2ft under a budget of Rs. 5000 within 3 months of time that can write a desired sentence on a given sheet of paper.

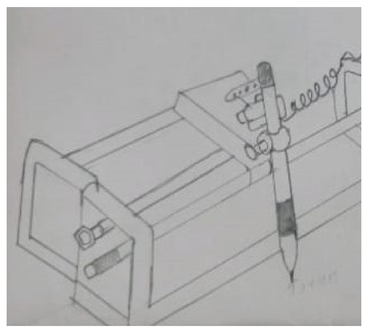
Sprint -1

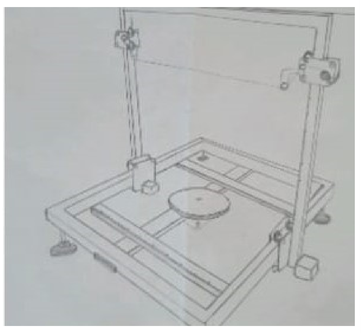
Subsystem Designed and developed during Sprint 1 is:
Base part and z axis assembly using servo.
Z AXIS servo assembly controls the movement of the pen required for drawing .



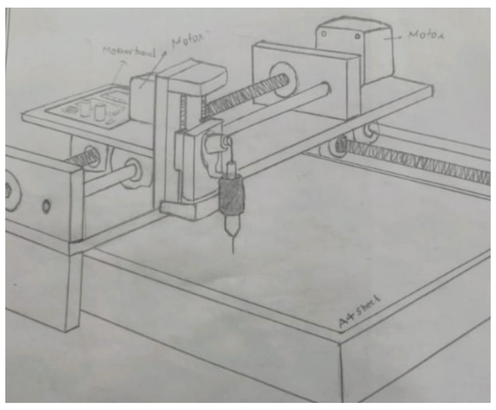
Conceptual Designs







Selected Conceptual Design



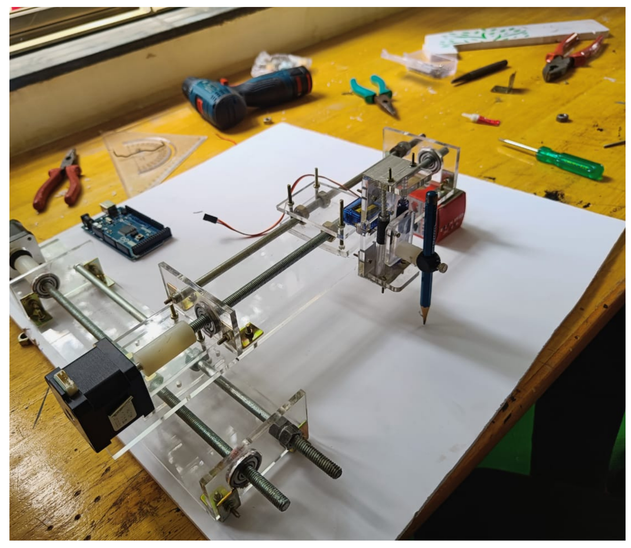
Mechanisms used in the Selected Design are:

1.LEAD SCREW
2.SPRING MECHANISM

Sprint -2

Subsystem Designed and developed during Sprint 2 is:
X and Y axis assembly using stepper motors.

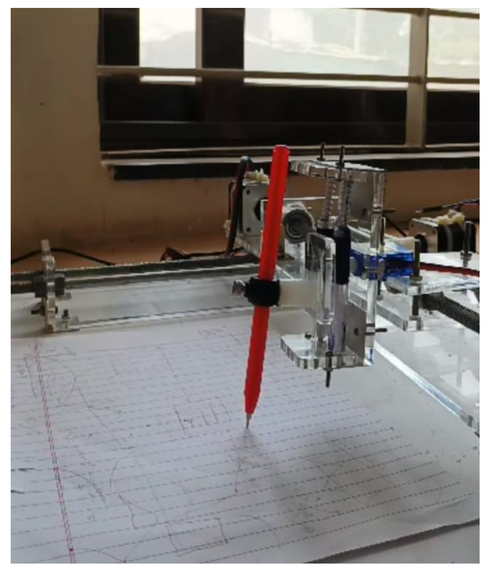
When the screw is rotated, the nut moves along the length of the screw, resulting in linear displacement.



Sprint -3

Subsystem Designed and developed during Sprint 3 is:
Hardware+software integration.

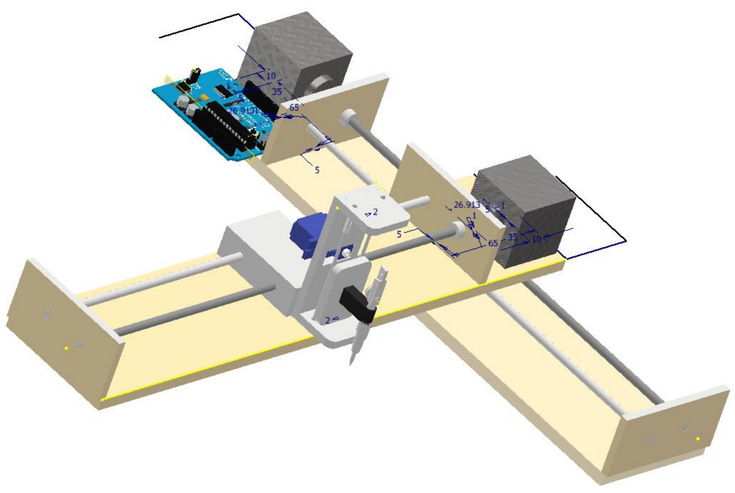
Downloading the required softwares and programming the bot.



Motor Sizing and Battery/Adapter Selection

For Z axis: Total torque= 0.04Nm
Hence Servo motor SG90 micro was selected
For X and Y axis:
total torque=413Nmm
Hence NEMA-17 Stepper motor was selected which provides a torque of 4.8kg-cm.

Virtual Implementation 3D Isometric Design



Final Prototype