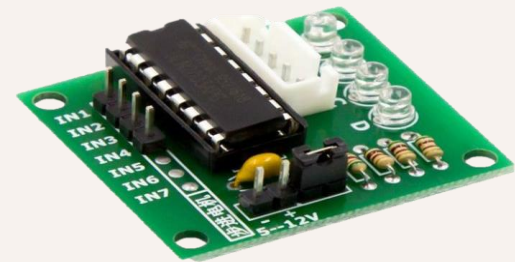# Wall_drawing Robot

Project components

Lifts and lowers the pen for drawing or moving.

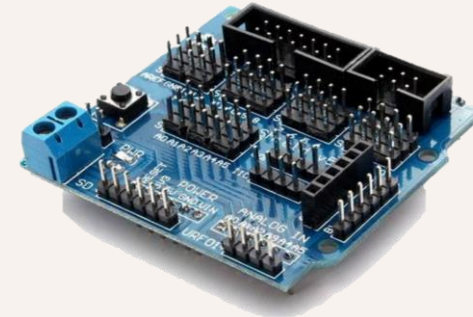The main microcontroller that controls the entire system.

Used to transfer precise rotational motion from the stepper motors to the threads, ensuring accurate pen positioning.
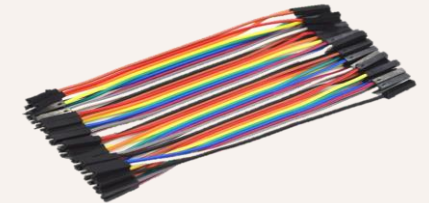
Drives the stepper motors by providing enough current.

Move the pen by winding and unwinding threads.

Makes it easier to connect multiple components to the Arduino.

Scientific Principle

X and Y coordinates are determined by measuring string lengths from each motor

The machine calculates the pen's position using the Pythagorean theorem

Similar to drawing circles using two strings.

Electrical Connections

Stepper motors connected via ULN2003 drivers.

Servo connected to pin 10.
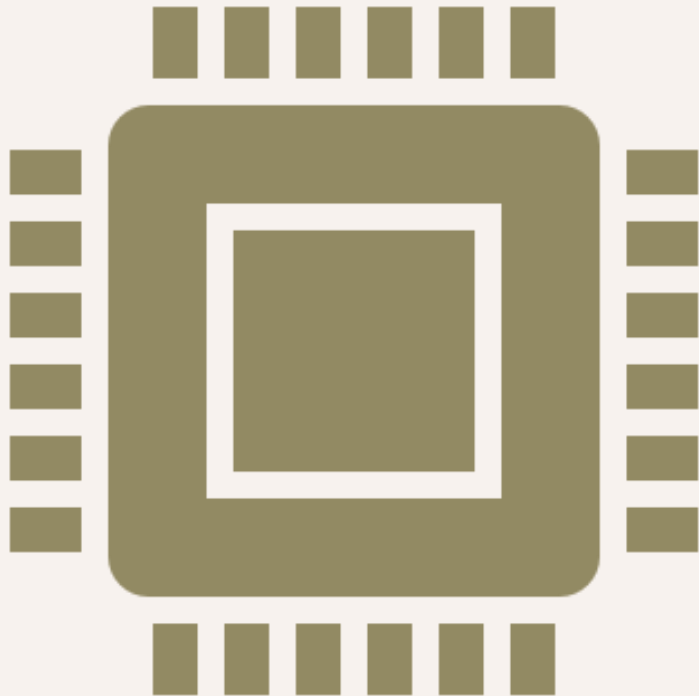
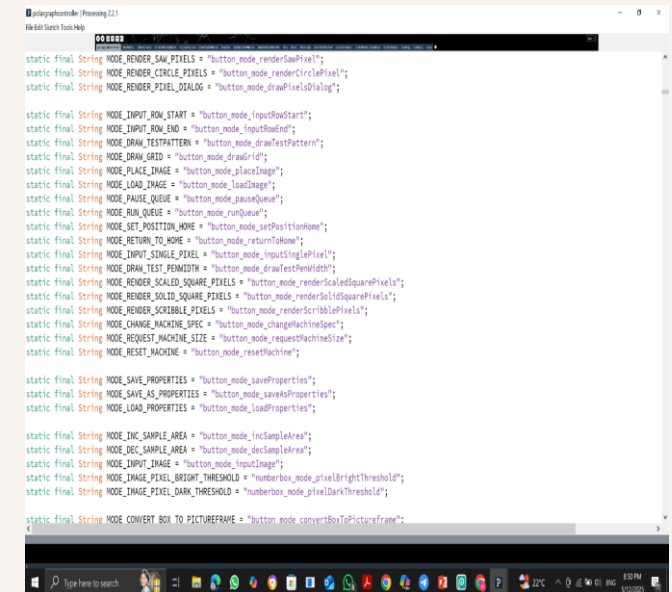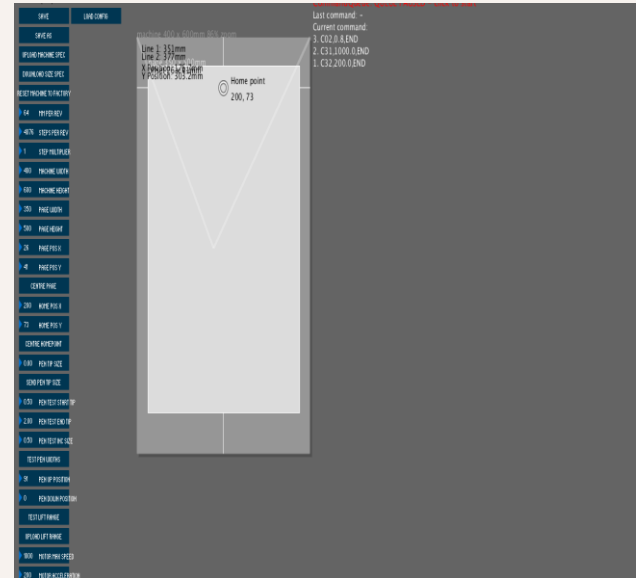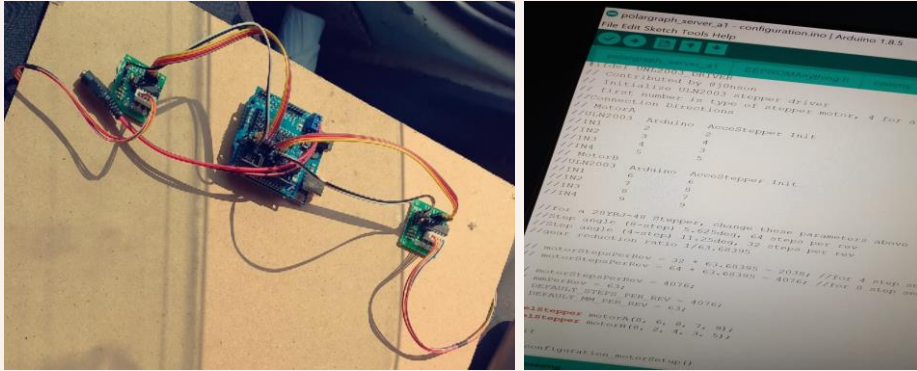Common ground is essential to avoid malfunction.

Arduino Code

- Based on the Polargraph Server firmware.

- Defined board and driver type.

- Angles and speed stored in EEPROM settings.
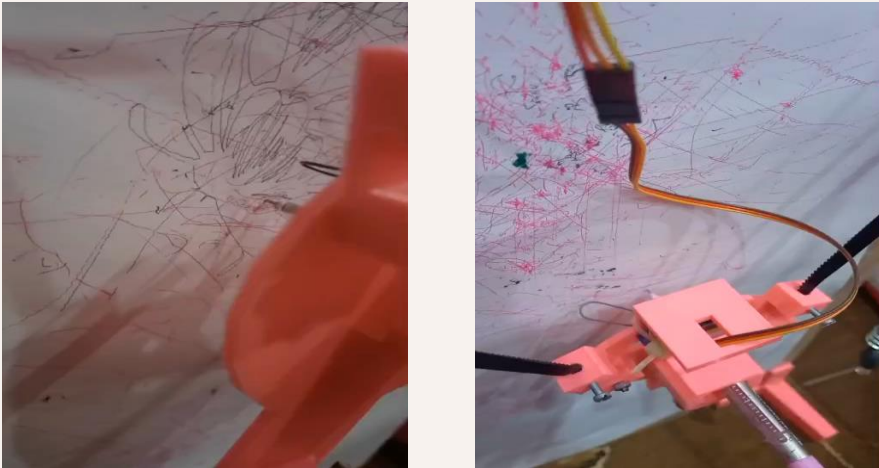
Software Interface

- Used Polargraph Controller (Processing-based).
- Load image, resize, and select drawing area.
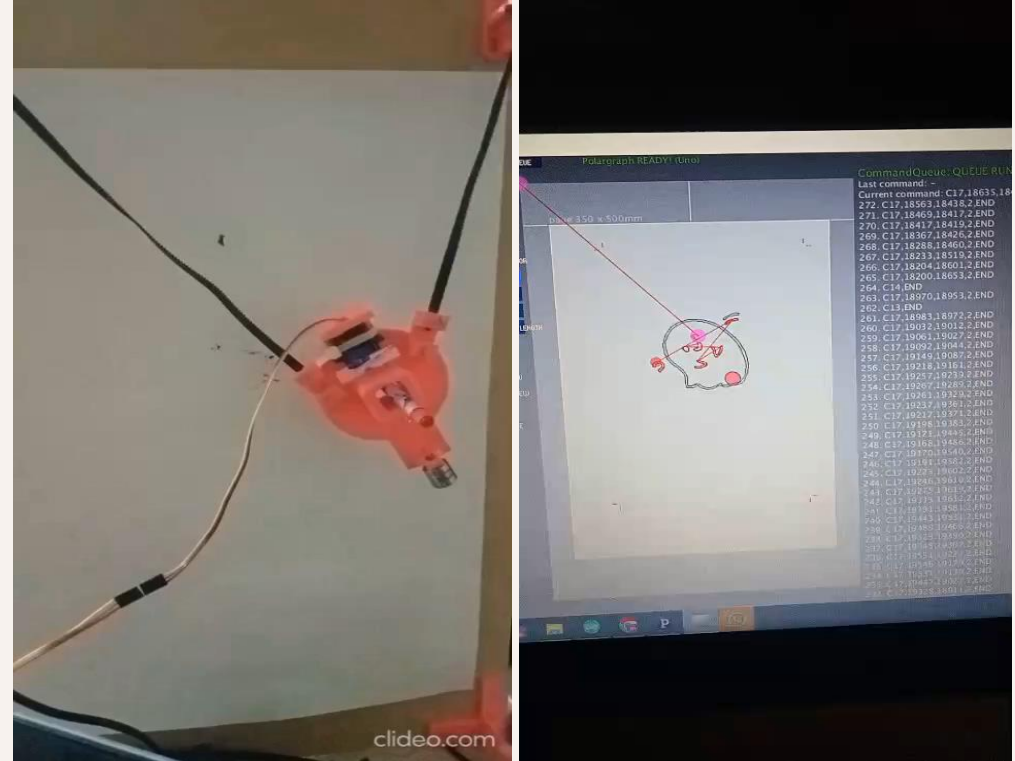- Control commands: pen up, pen down, start drawing.

Testing & Issues

Inverted movement solved by rewiring motors.

Drawings exceeded paper size—solved by resizing images.

Servo issue fixed by adjusting angles and power.

Results

- Machine successfully drew clear images.
- Gradual tuning improved speed and accuracy.
- Final drawing closely matched the original image.
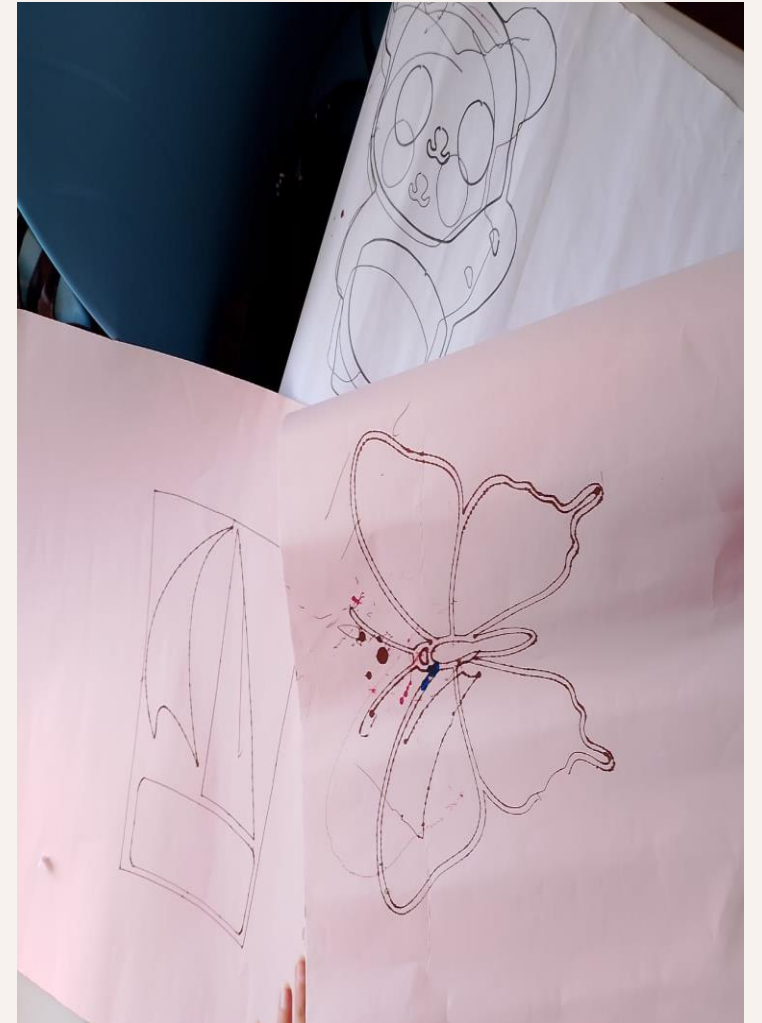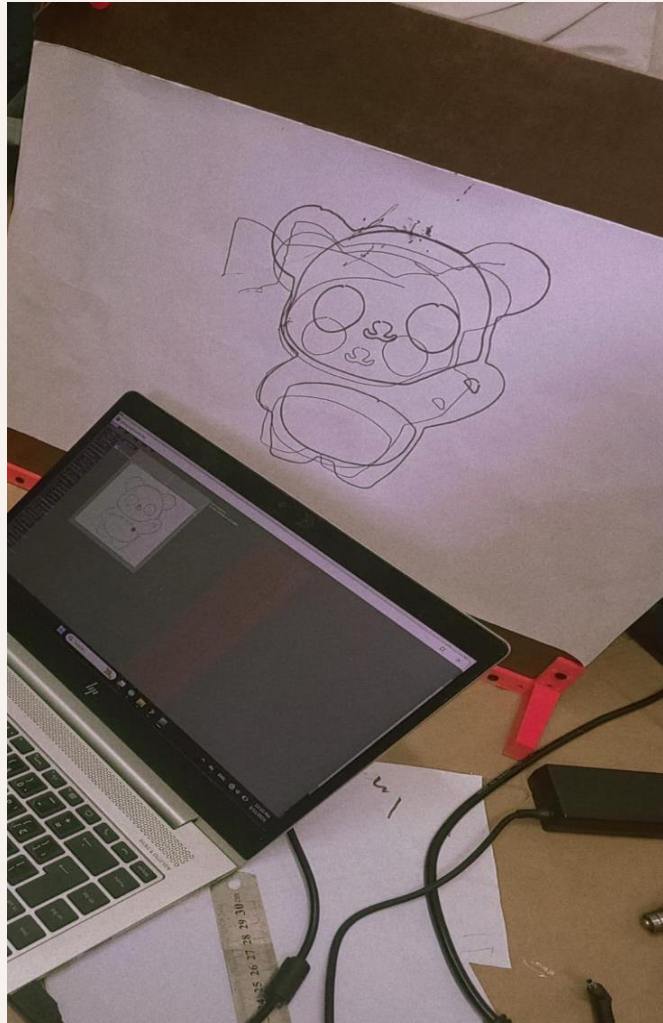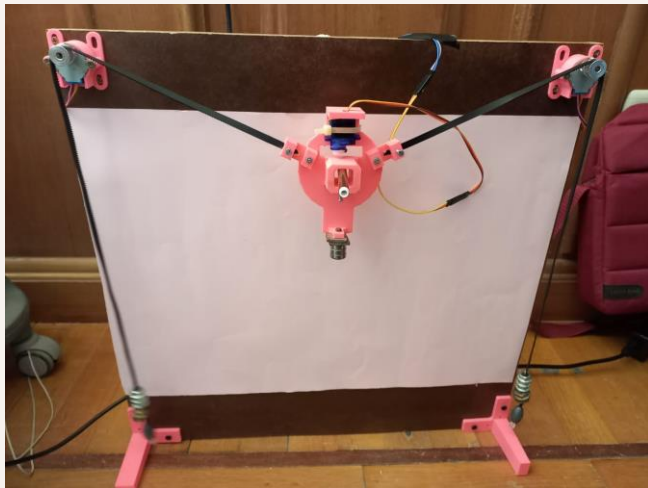
Conclusion

- Learned how to wire and program a complete system.
- Useful for education and artistic drawing.
- Can be expanded with color or larger canvas support.