E1.07 - The Artistic Automaton
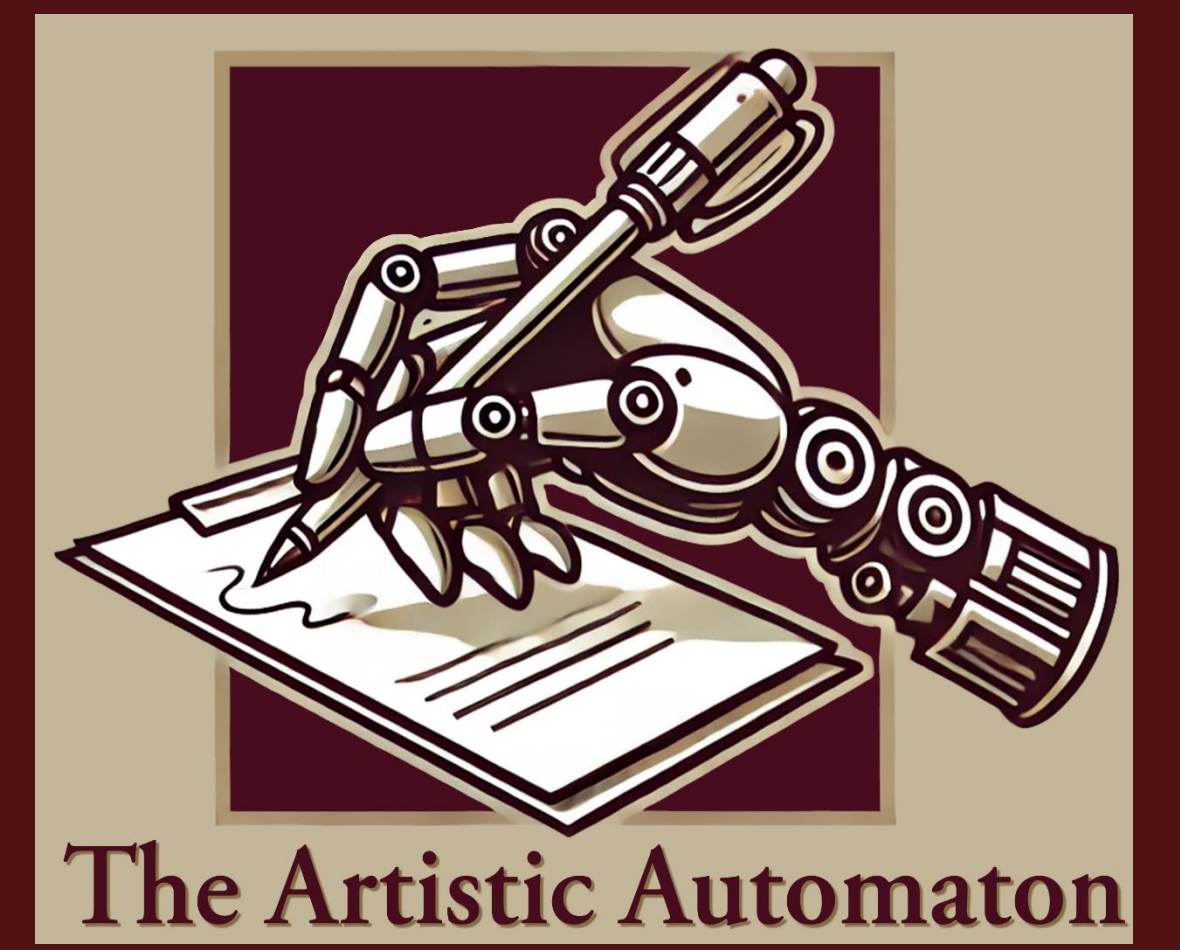
Jamal Close, Paul Henson, Iris Okoro, Nick Whipple

Sponsor: Mr. Quinn & Dr. Awoniyi and Advisor: Mr. Stevens

TEXAS STATE — INGRAM SCHOOL OF ENGINEERING
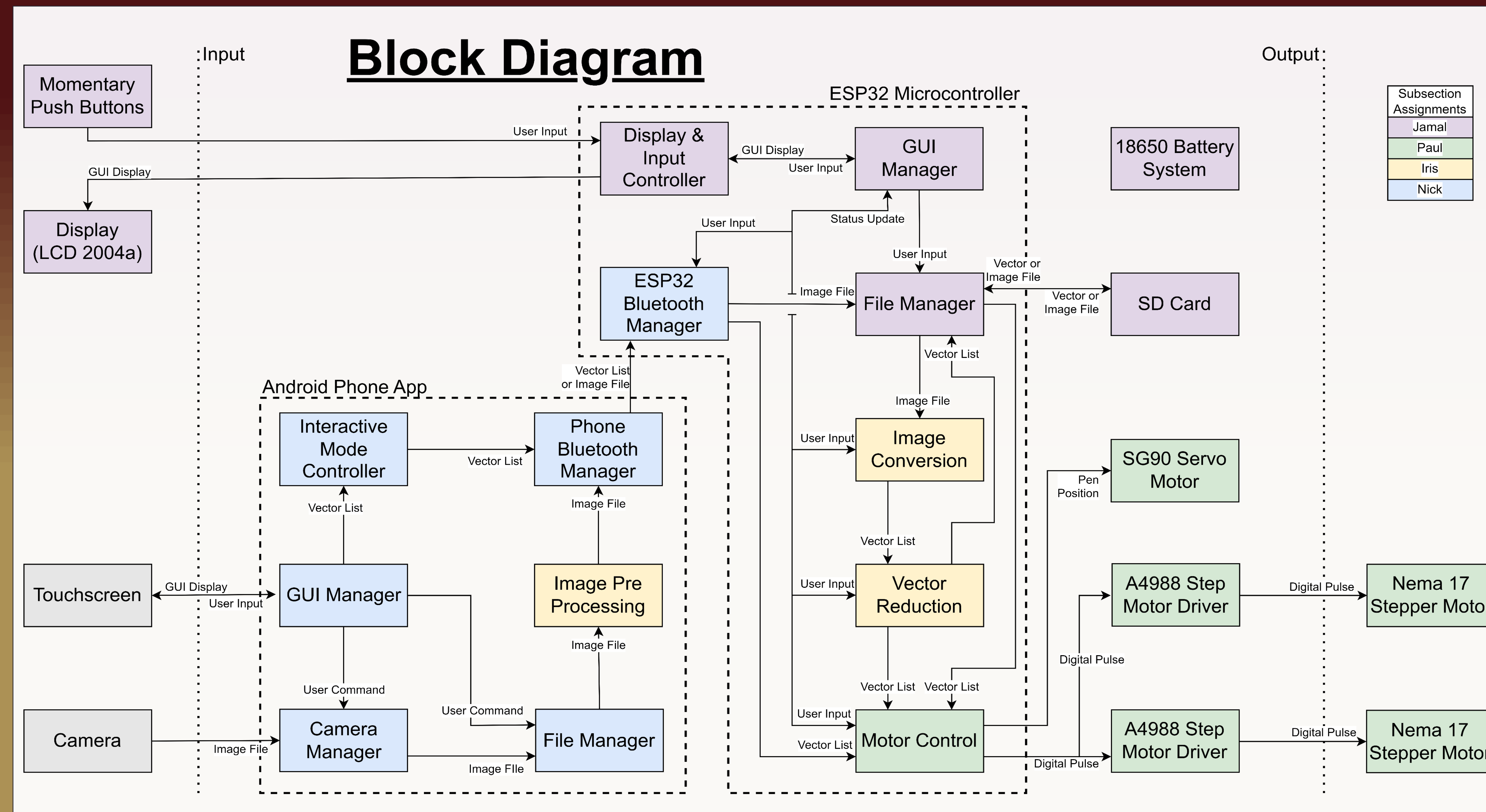
The Artistic Automaton

Project Overview

This project showcases a method of controlling a mechanical arm utilizing motors, an ESP32 processor, and a phone app to draw desired images.

D1 Requirements

- Uses mechanical arm with microcontroller to draw simple shapes
- Prototype is under budget of $136

Block Diagram

Our Team

Paul   Nick   Jamal   Iris

D1 Accomplishments

- Prototype controls stepper motors to move to specified points
- User selects file input on LCD Display
- Showcase of app features
- Image vectorization

D2 Plans

- App to processor communication
- Establishing "Interactive Mode"
- Arm draws both portrait and abstract images
- Image pre-processing and vector reduction

Power Interface

Voltage	Input Source	Min	Max
14.8V	Battery Holder	0A	10 A

Voltage	Out. Destination	Min	Max
12V	Stepper Motors	0.1A	0.4A
6V	Servo Motor	4A	650mA
3.3V	ESP32	40mA	300mA
3.3V	LCD Display	2mA	35mA
3.3V	SD Module	200mA	300mA
3.3V	ON/OFF Switch	0.5A	1A

Motion Control

- 2x Geared Stepper Motor (*17HS13-0404S-PG27*)
- Vector based movement
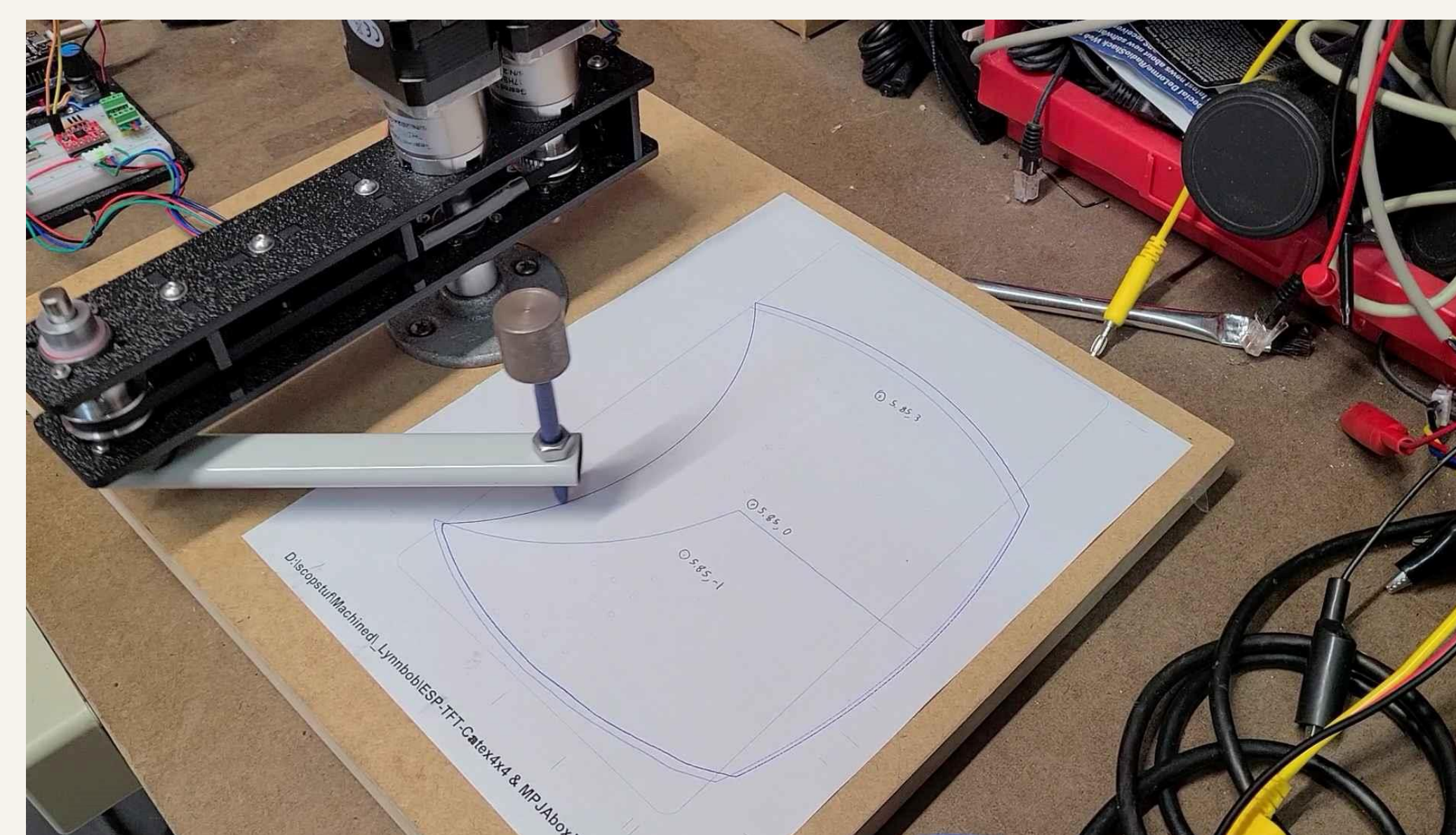- Automatic speed/ acceleration regulation
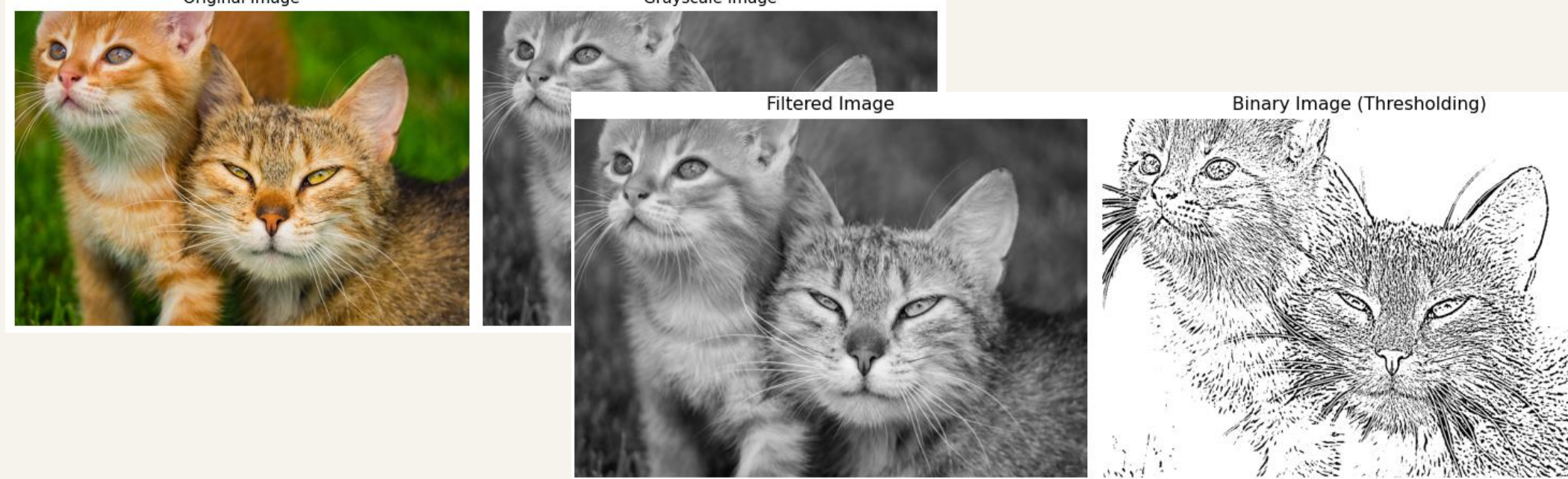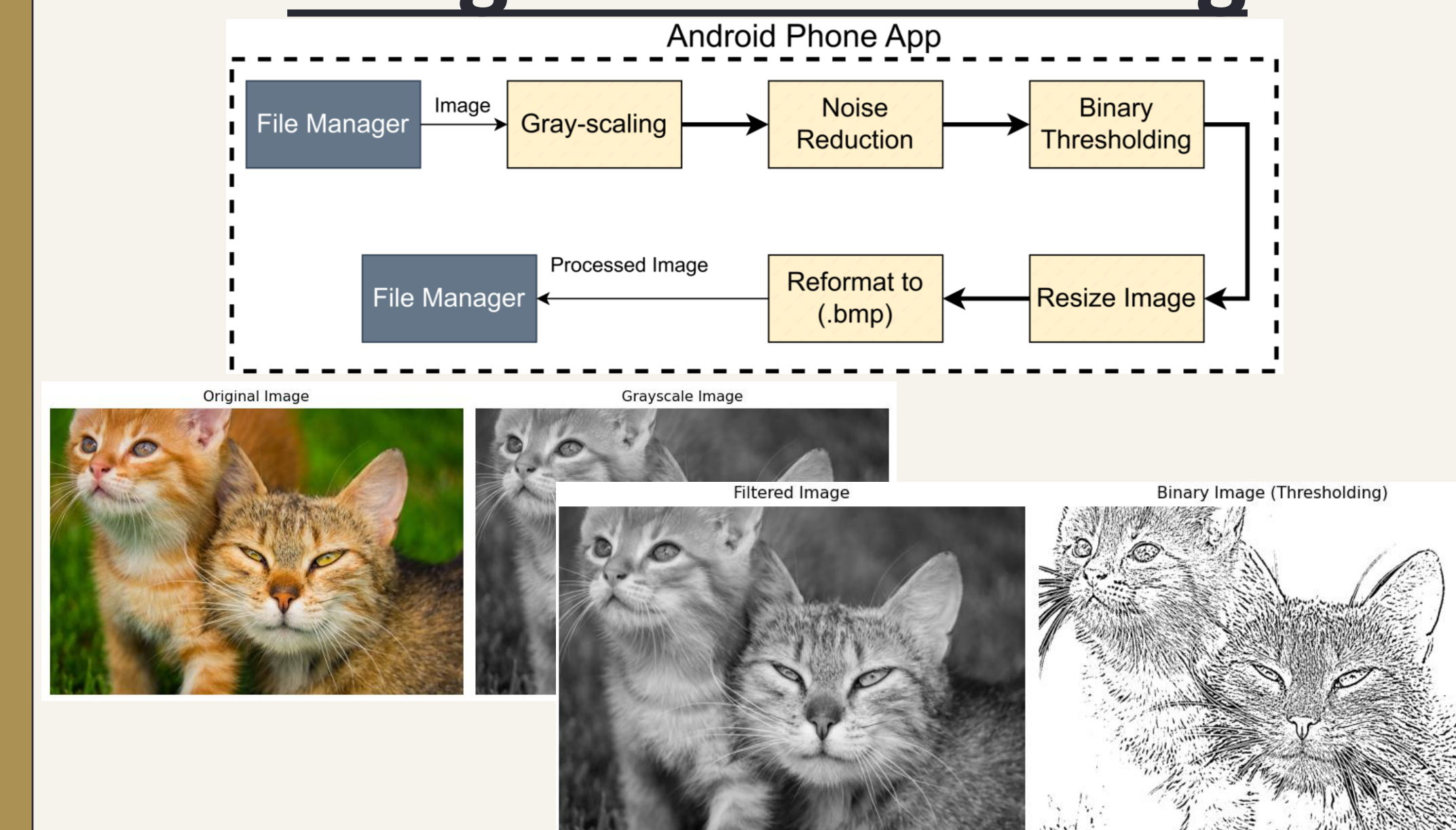
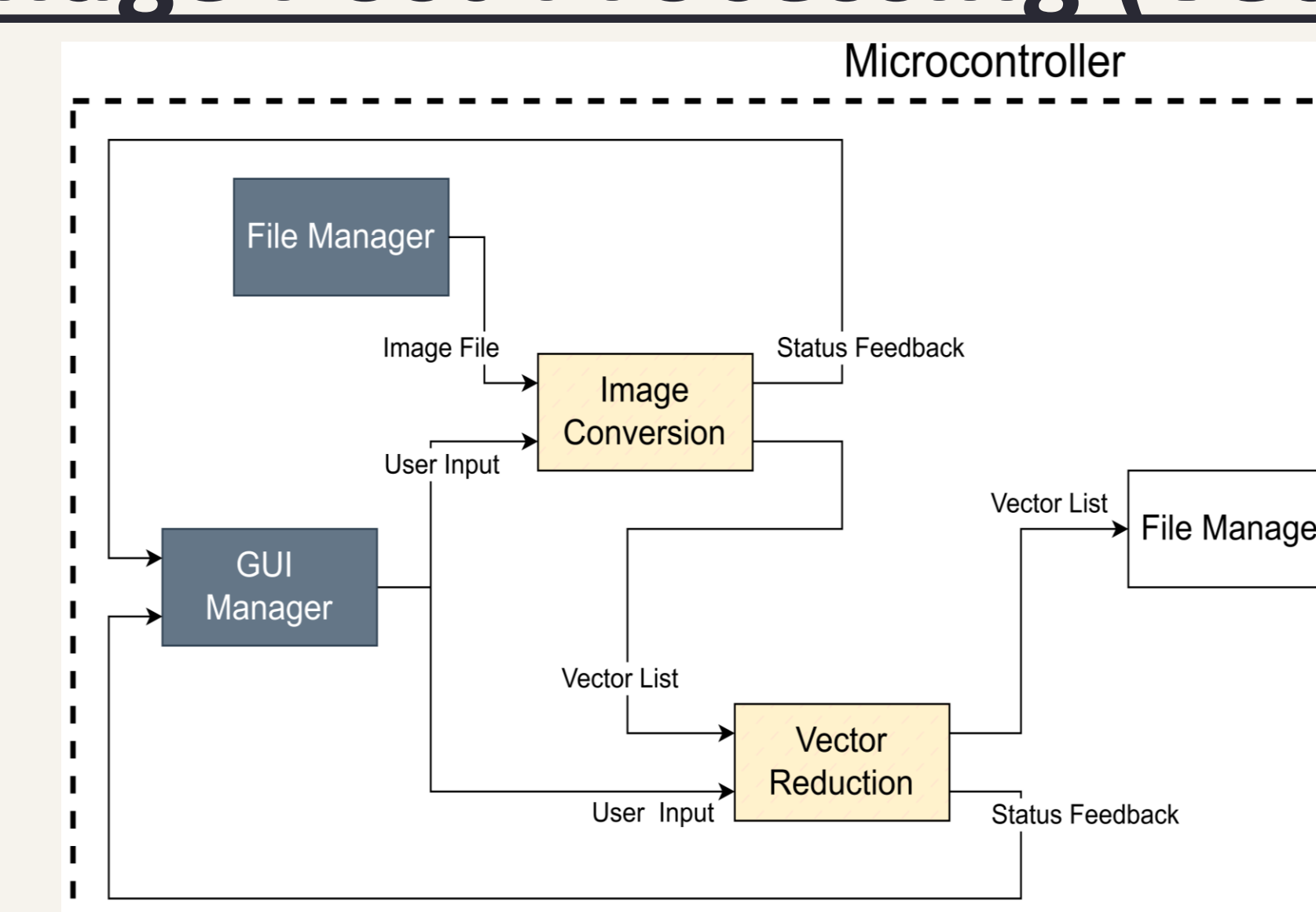## Mechanical Structure

Image Pre-Processing

Image Post-Processing (Vectors)

Phone App Interface

- Show current Artbot status
- Connect to ESP32 via Bluetooth
- Enable native android image capture through camera or filesystem.
- Control Artbot in real time
- Adjust image resolution, Backlash compensation, etc.

Interactive Mode

Controls arm with Joystick

Raise/Lower Pen

Quick draw simple shapes