# Ian Spehar

## Engineering Portfolio

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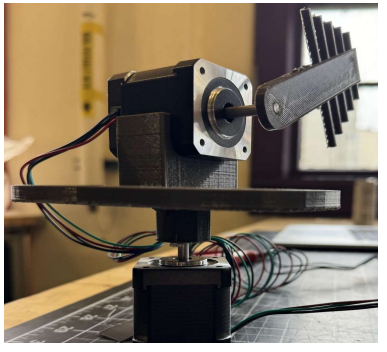
# Automatic Antenna Tracker

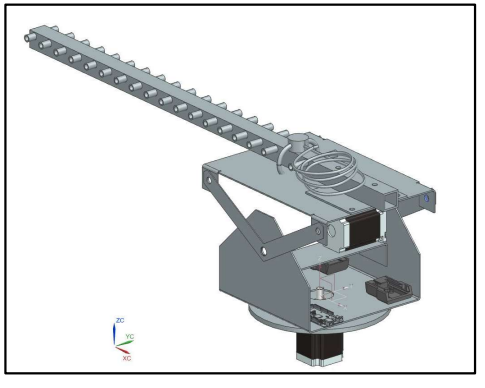
## OSU Rocket Team Project

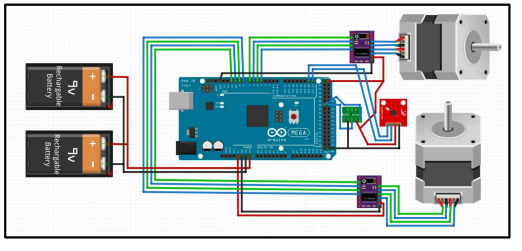
**Overview:** Keeps the antenna aligned for constant communication with the rocket, improving launch data collection and rocket retrieval

**Personal contributions:** Founded the project, developed all of the tracking logic software, and assisted with the mechanical design

**Code Features:** Performs real-time calculations using GPS data to keep it locked onto the rocket, actuating motors for precise tracking. It optimizes the tracking path for the quickest route and includes safety cutouts for secure operation







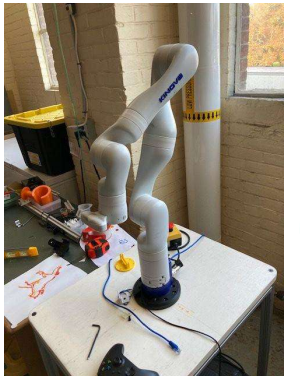
# Pollock, The Painting Robot

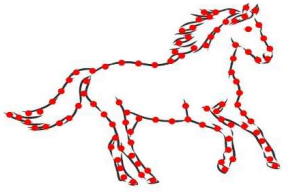
ROB-514 Project

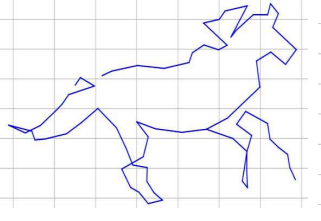
**Overview:** Pollock is a repurposed Kinova robot arm that autonomously analyzes images and translates them into artistic interpretations using brush strokes

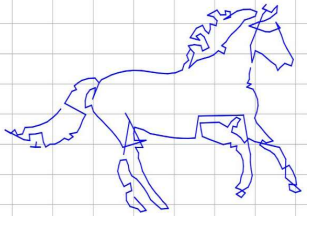
**Personal contributions:** Developed the core algorithm that interprets images and converts them into a sequence of brush stroke commands for the robot to follow

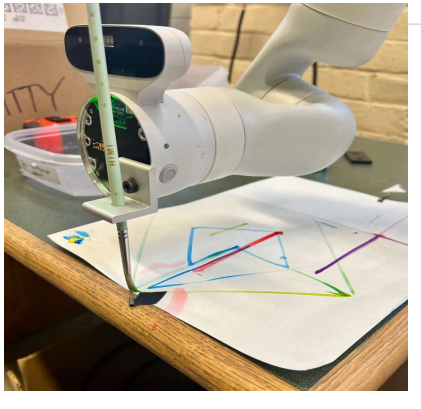
**Code Features:** Processes images by identifying contours and condensing them into points. Implements advanced pathing logic to create sequenced brush strokes, producing a painting resembling the original image

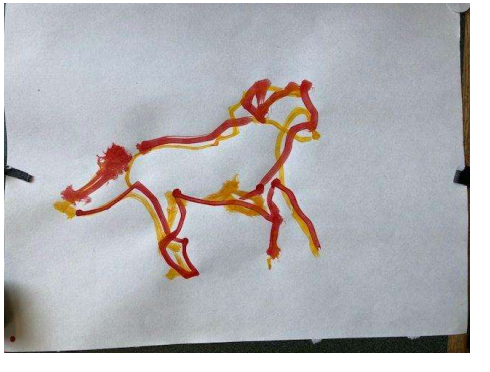












# Robot Car

## Personal Project

**Overview:** Remote-controlled robot car run wirelessly by PS4 controller featuring collision avoidance, precision servo steering, and voice responses

**Personal contributions:** Wrote all software, designed and assembled the body, steering mechanism, and electrical circuit

**Code Features:** Includes automated controller pairing and startup, crash deterrence, and will insult you in a British accent when you almost crash.