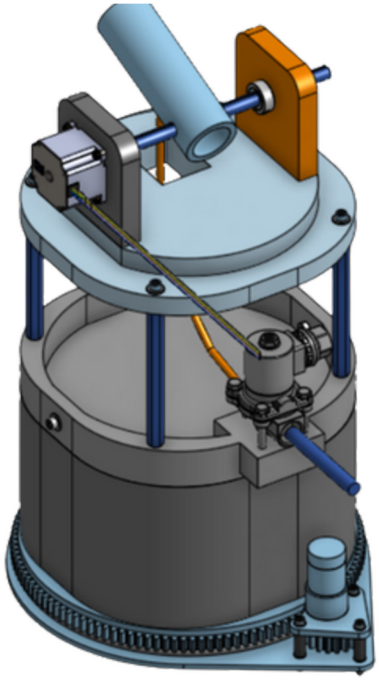
RYAN RUNDLE

UNDERGRADUATE MECHANICAL ENGINEER | UC BERKELEY

rdrundle@outlook.com
714 403 7837
linkedin.com/in/rdrundle

ROOFTOP FIRE SUPPRESSION SYSTEM



Initial design

Objective

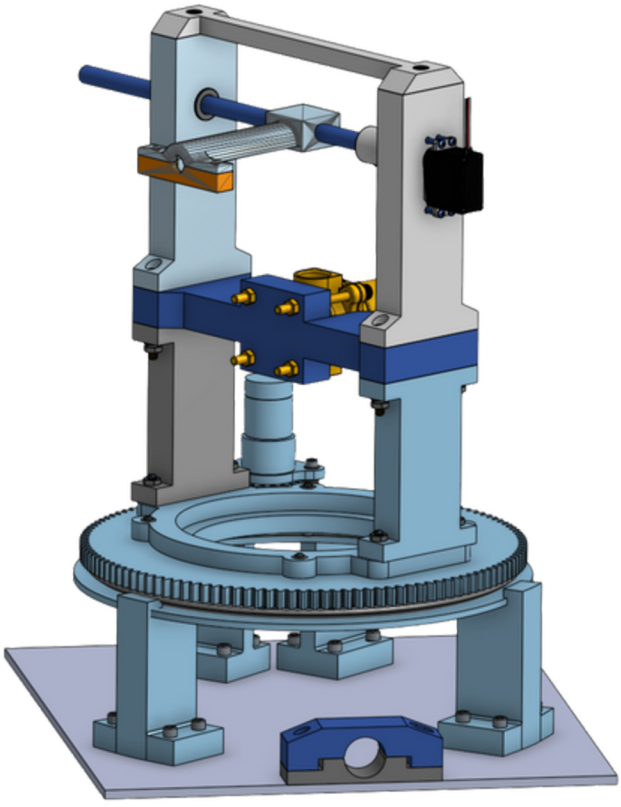
- Design and build an autonomous turret that detects hot spots and fires water at it
- Integrate various sensors and valves through a main turret body to accurately shoot water

Methods

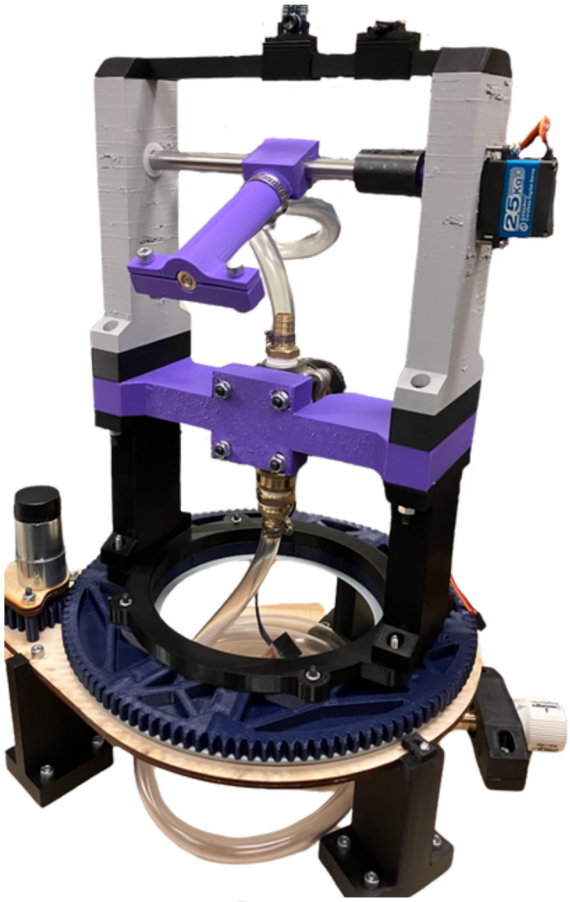
- Sketch an initial design by hand and present it course staff
- Take feedback from design staff and create multiple iterations of the model
- Print the turret body and assemble the transmission and fluid-transporting elements

Results

- Successfully fired water at temperature hot spots using a standard garden hose connection



Final design



Prototype

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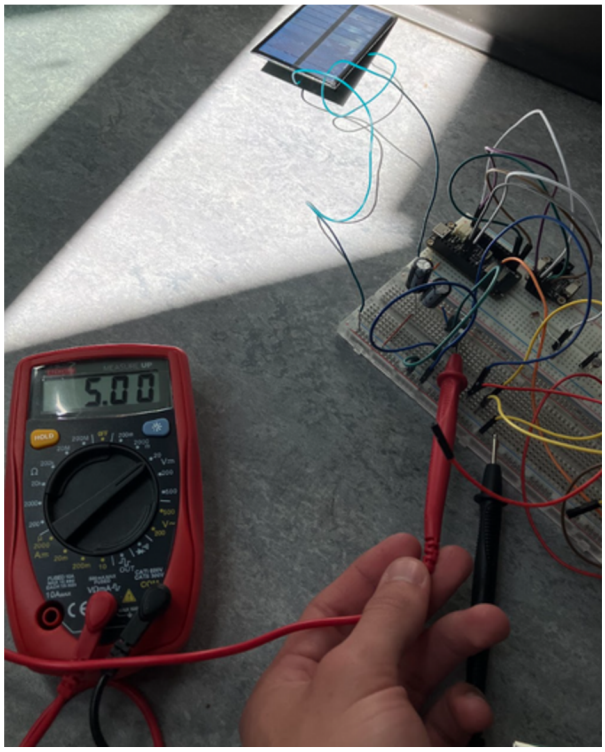
SOLAR-TRACKING PHONE CHARGER



Multimeter showing 5V output

Objective

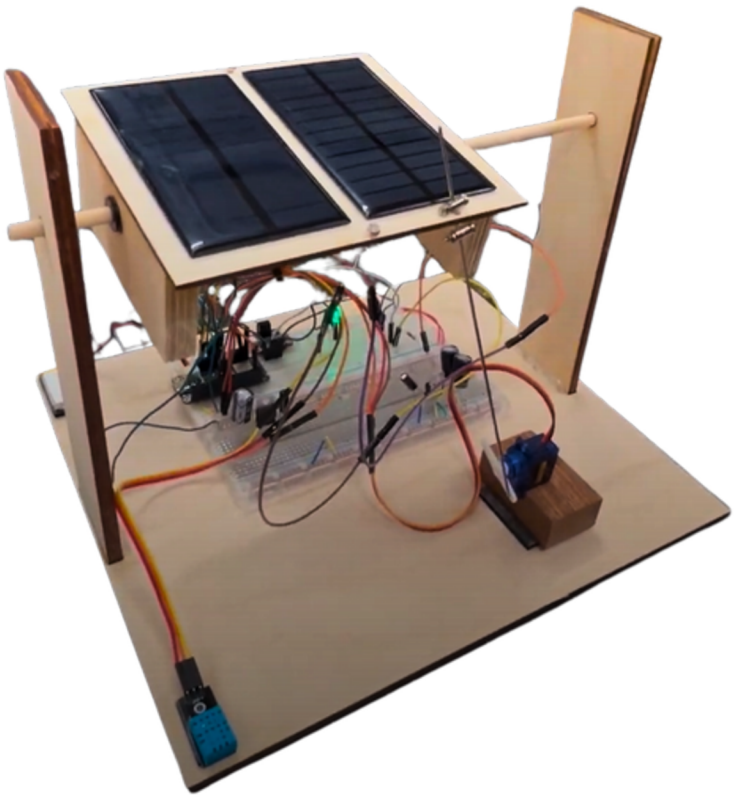
- Use light dependent resistors (LDR), a servo motor, plywood, solar panels, and an ESP32 to create a single axis solar tracker that can produce a 5V and 3.3V voltage output
- Program the device using Python

Methods

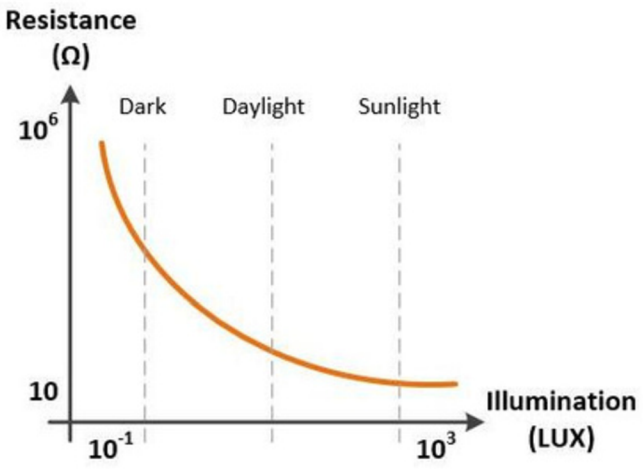
- Design the circuit diagram around voltage resistors, capacitors, and resistors to maintain a constant 5V and 3.3V power output
- Program the servo motor to respond to changes in light-resistor readings

Results

- Prototype generated a constant 3.3V from one panel and 5V from the other, sufficient to power the ESP32 and an external device
- Solar panels moved to the angle which maximized normal incident sunlight



Prototype



LDR response curve