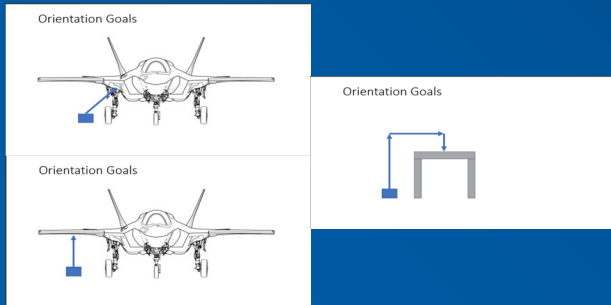


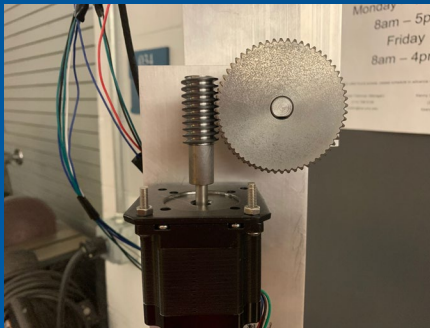
Intro

Goals and Final Design

- Develop a semi-autonomous robot to capture photos of defects on the underside of aircraft, specifically the F-35
- Collect and label thousands of images in real time while reducing human error
- Finalize a design that can be easily moved and operated by 1-2 people
- Utilize technology that is safe to touch the F-35 surface and integrate sensors to reduce chances of collision
- Introduce points of modularity so that future repairs and upgrades can be made easily



Mechanical Specifications



- Objectives/Constraints Met:
 - Can reach 7'
 - 2' maximum arm span
 - Moveable by 1 person
 - No silicone parts
 - 5 DOF achieved in arm
- Features:
 - Modular design; can replace linear actuator, arm, or base
 - Differential steering
 - Variable Speeds
 - Safety: worm gears used to prevent sudden movement should robot lose power



Electrical/Software Specifications

Objectives/Constraints Met:

- User can move/adjust box as defect travels across screen. Arm moves automatically. Coordinates and image saved. High accuracy due to human guidance.
- Over 1000 labeled images per minute of recording. Rapid data labelling!
- 1 Raspberry Pi, 2 Arduinos, 5 Stepper Motors, 5 Stepper Motor Drivers, 1 LIDAR, 1 Linear Actuator, 1 Channel Relay, 2 Servos, 5 batteries, 1 Camera, I2C communication, over 200 wires => A completely wired robot. Minimizes security risks.
- GUI to move base, move actuator, and move arm by user. Operable by 1 user

