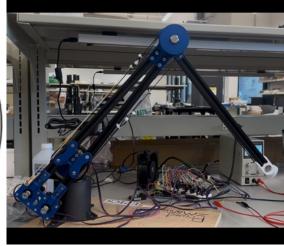
EVAN LIN MECHANICAL ENGINEERING AT PURDUE UNIVERSITY



PROJECT MANUS - STUDENT LEAD PROJECT





What?

- Designed a 5 degree of freedom robotic arm based on Arduino and **NEMA 17 stepper motors**
- Optimized for ease of assembly and reproducibility with 3D printed parts to encourage STEM education within high schools

How?

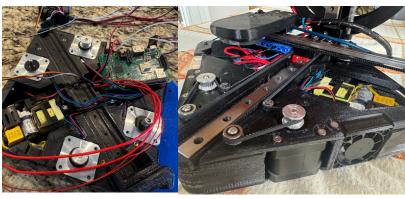
- Modeled all components using **Fusion** A final prototype has been 360
- Incorporated interference and screw joints for simplicity
- Used **geometry tools** to generate gear tooth profiles suitable for 3D printing

Results

- assembled and plans have been made available for high schools
- RC controlled for accessibility
- Interchangeable end effectors
- Belt-driven to reduce moving weight

INVERTED CORE-XY 3D PRINTER - PERSONAL PROJECT







What?

- Designed a 3D printer with an upside-down Core-XY motion system to concentrate moving mass • at the base
- Prioritized space efficiency with a high build volume to footprint ratio
- Developed a robust and lightweight toolend and bed holder

How?

- around a 3D printed chassis
- Integrated fan ducts and wire channels for proper heat dissipation
- Implemented **DFA principles** to reduce parts required and assembly cost
- Fabricated using rapid prototyping methods

Results

- Used SolidWorks to fit all components 400% higher build area to footprint ratio compared to traditional printers (Prusa Mk4)
 - Achieves print speeds of 220 mm/s, reducing print time by 30% on average
 - Removable bed allows for quick turnaround time