

Innovation Lab Technical Assistant At the Goddard Space Flight Center



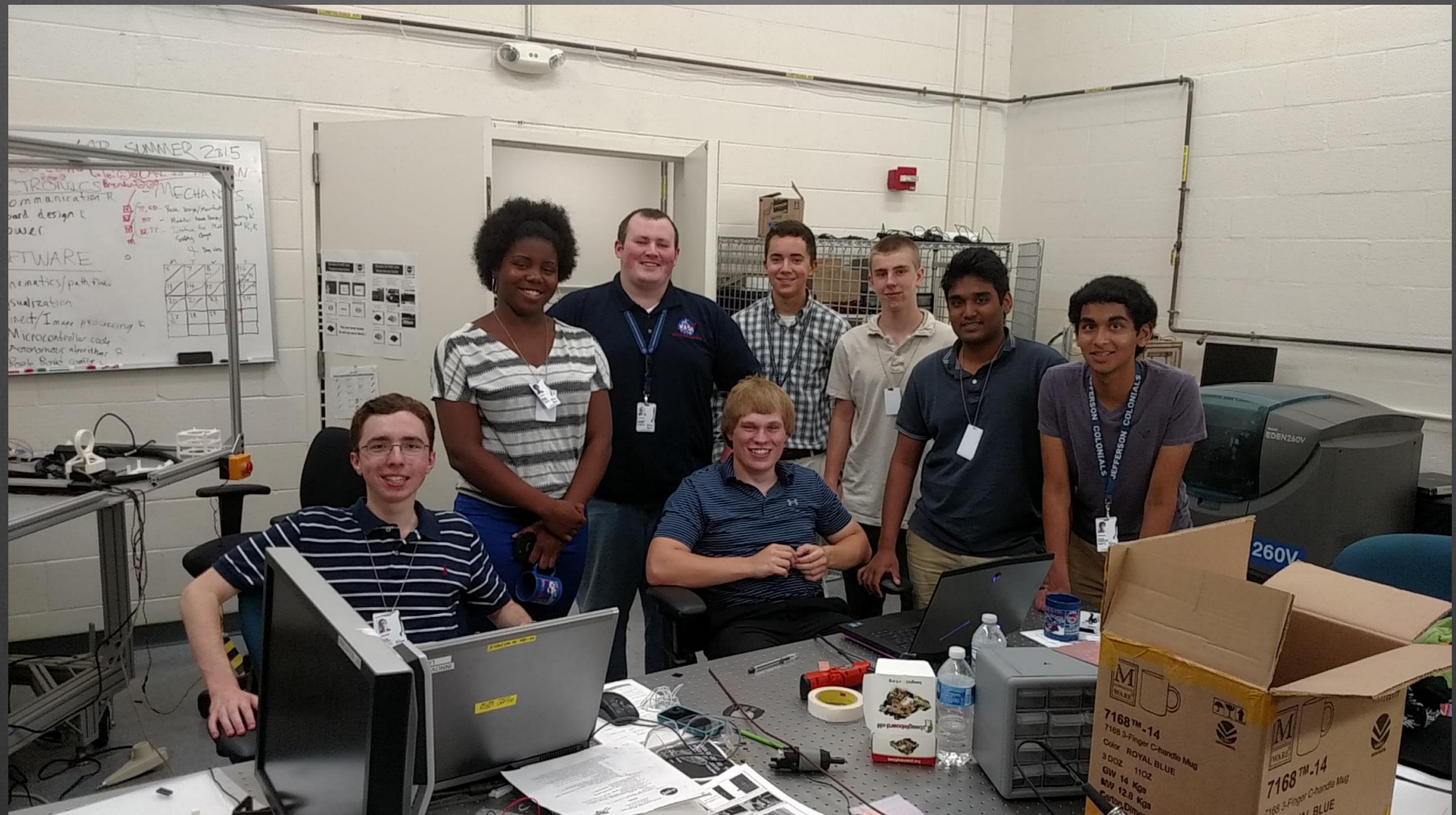
AMB

ADVANCED MANUFACTURING BRANCH

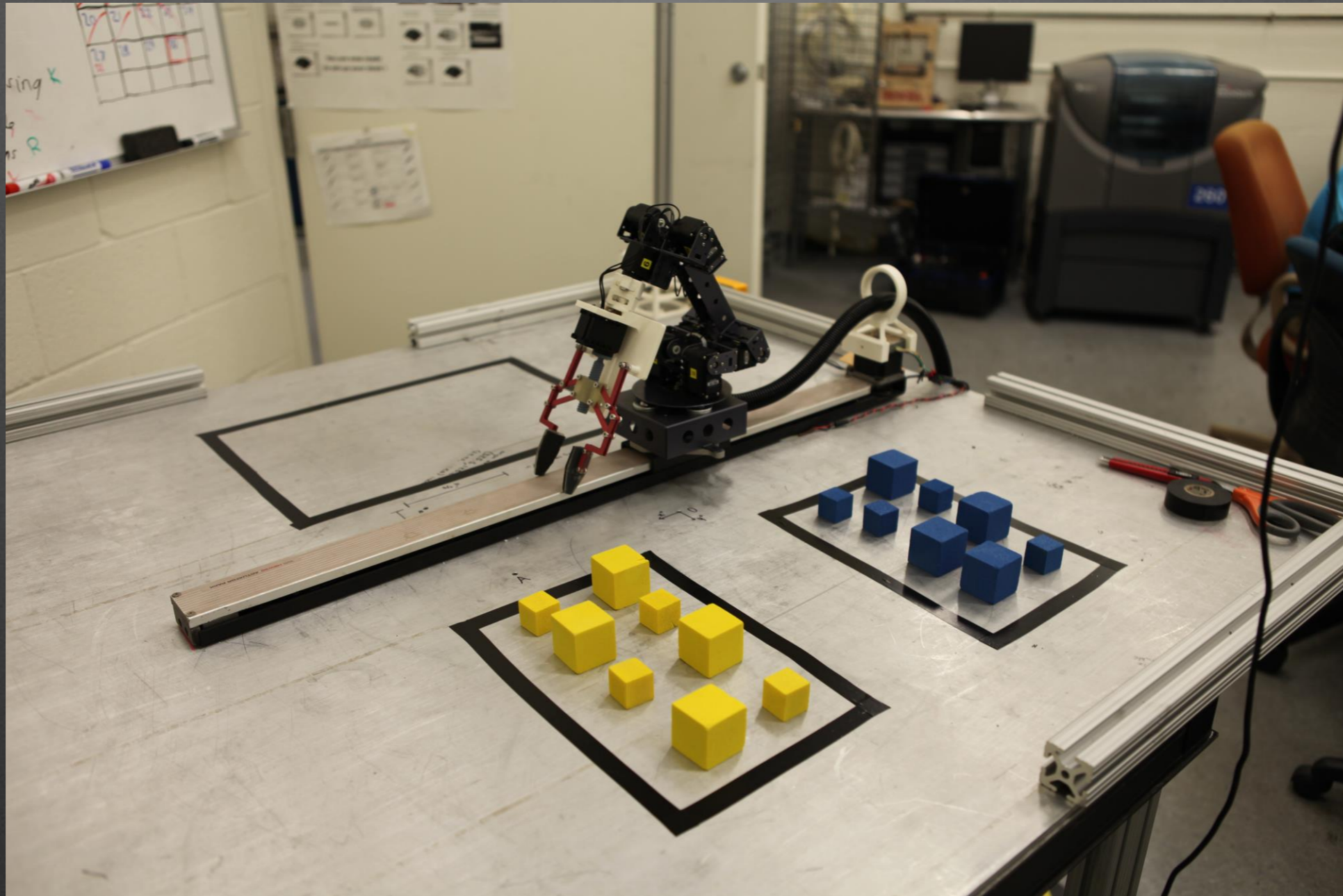
CODE 547



Innovation Lab

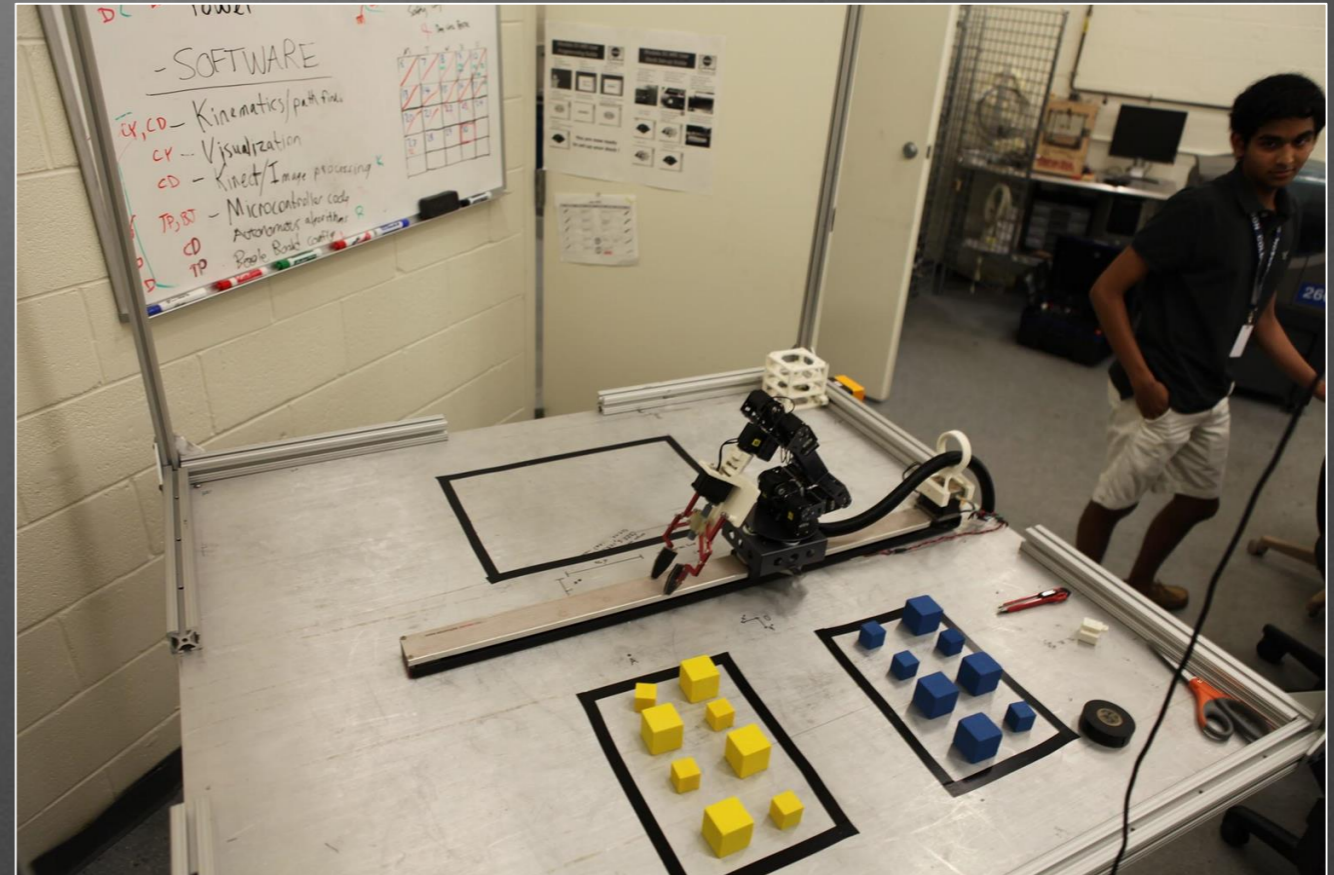


Autonomous Robotic Manipulator System for Advanced Manufacturing (ARMS)

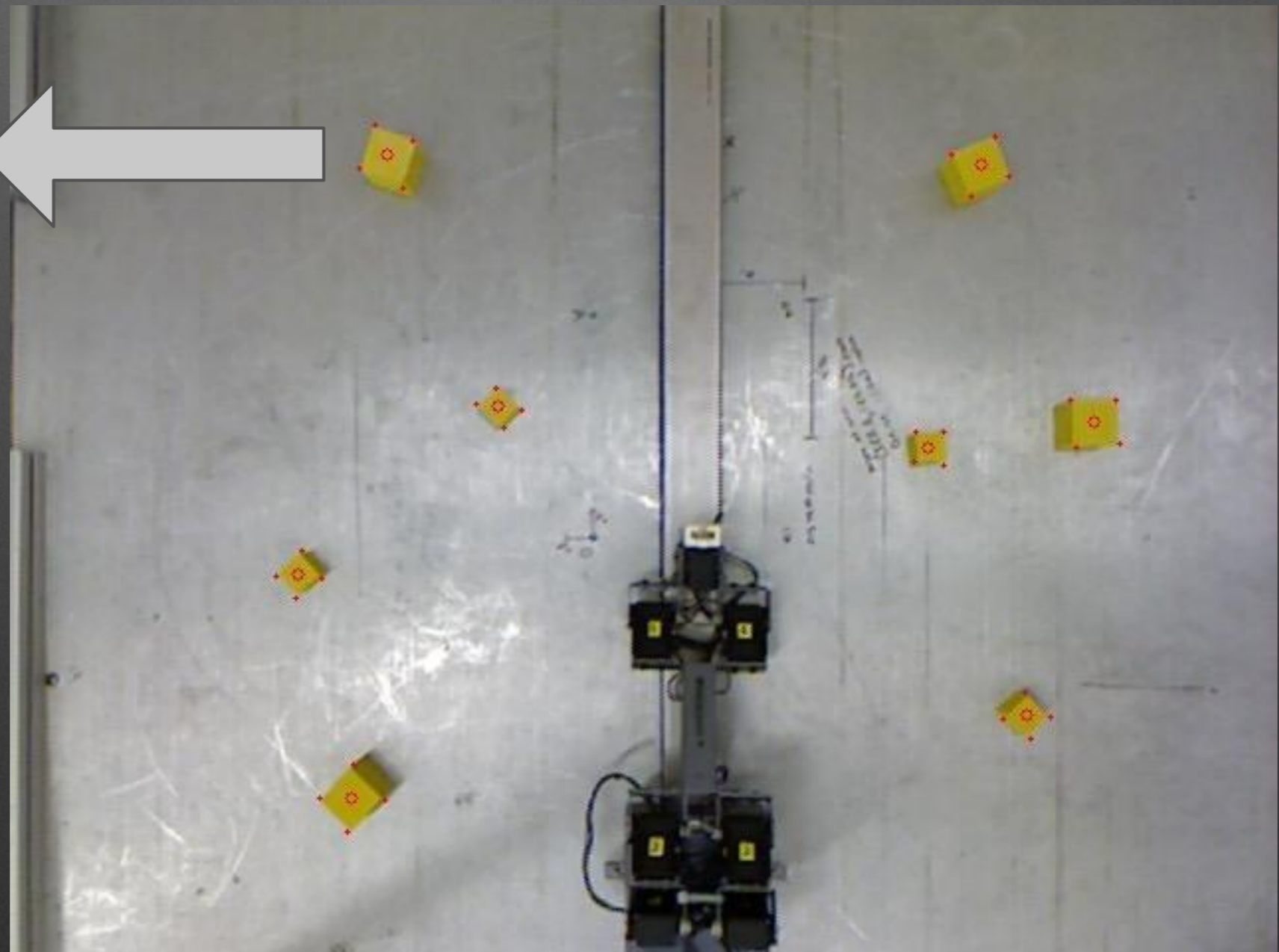
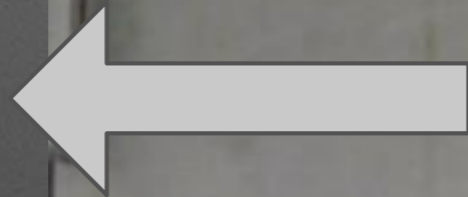


System Overview

- 6-DOF COTS robotic arm mounted on linear track
 - interchangeable head system for multiple capabilities
- Xbox 360 Kinect for vision system
- Linux-based central processor, running control, vision, and simulation software
- Auxiliary microcontrollers for actuation
- Mounted inside mobile platform with integrated safety cage

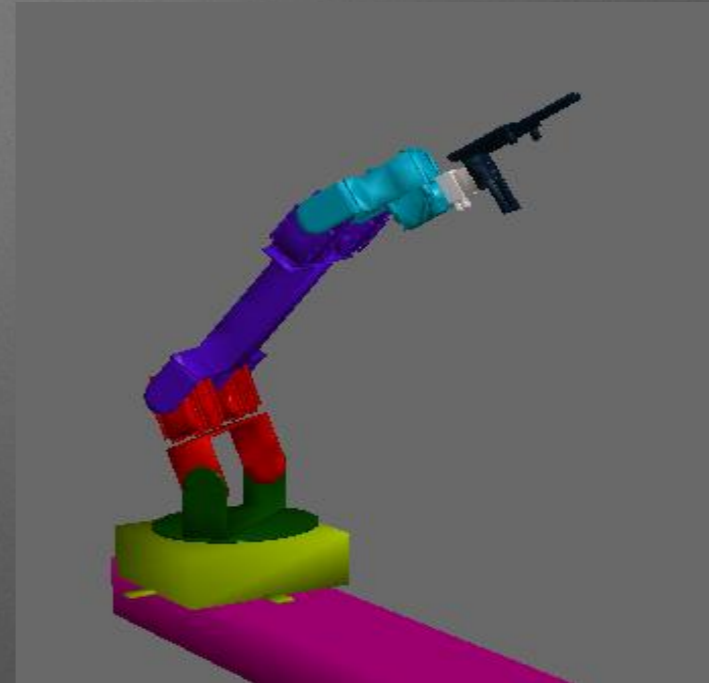


Computer Vision and Kinect

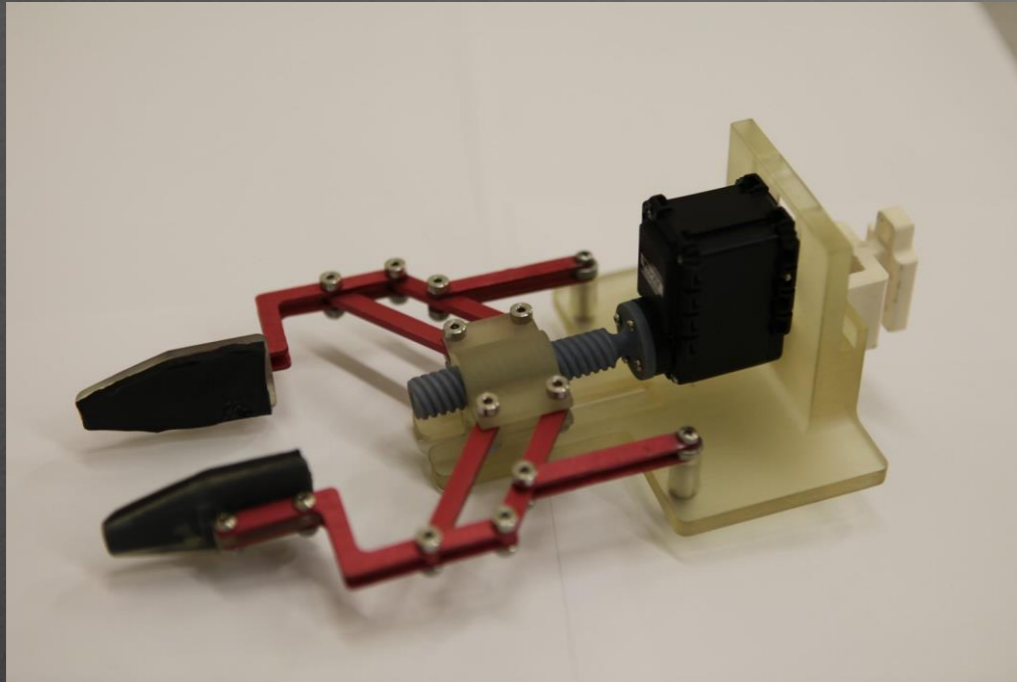


Simulation

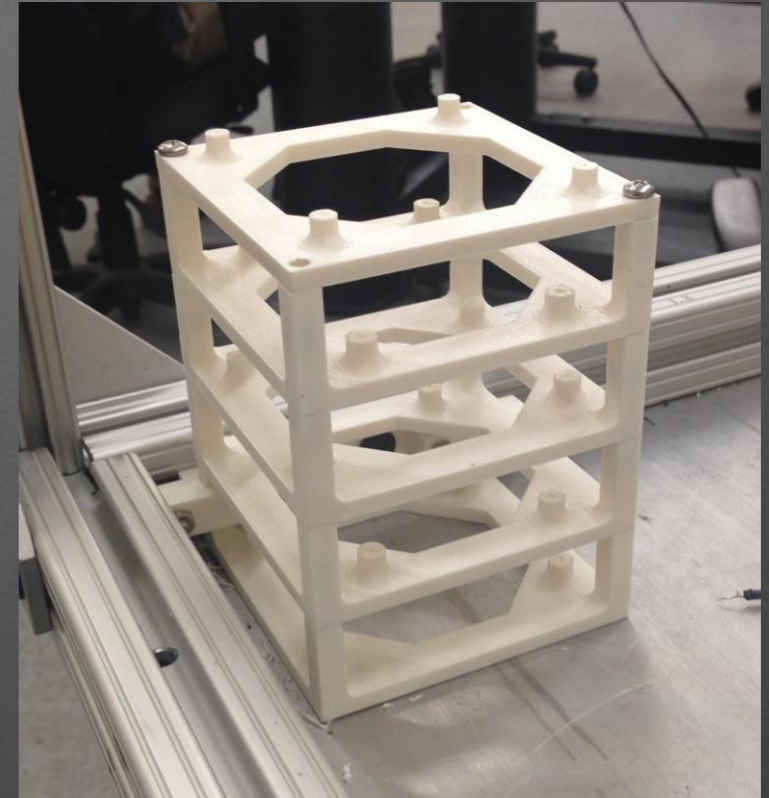
- Generated environments
- Non-destructive Simulation
- Projection of reality



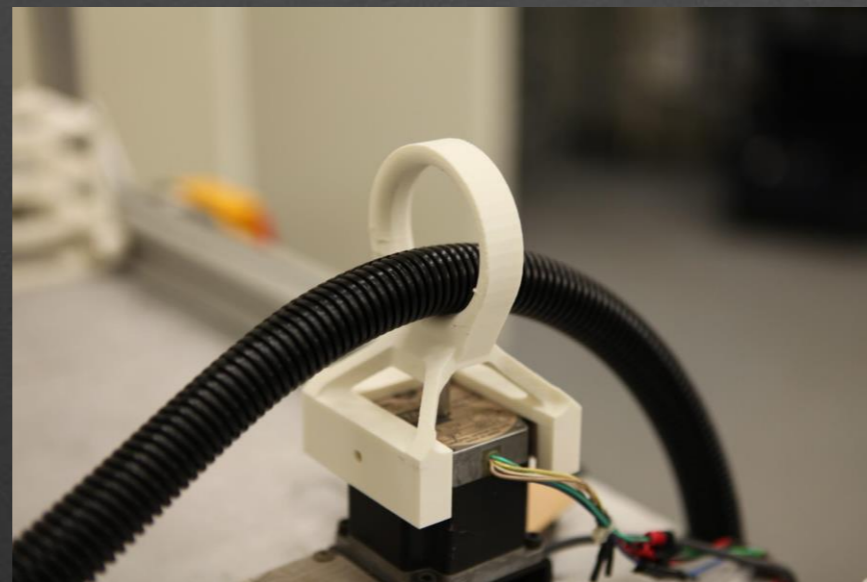
Manufactured Parts



Claw Base Redesigned
Resin

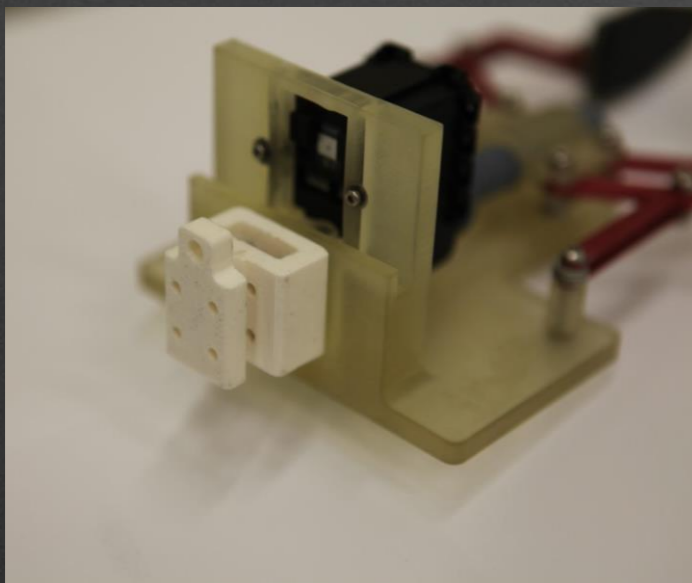
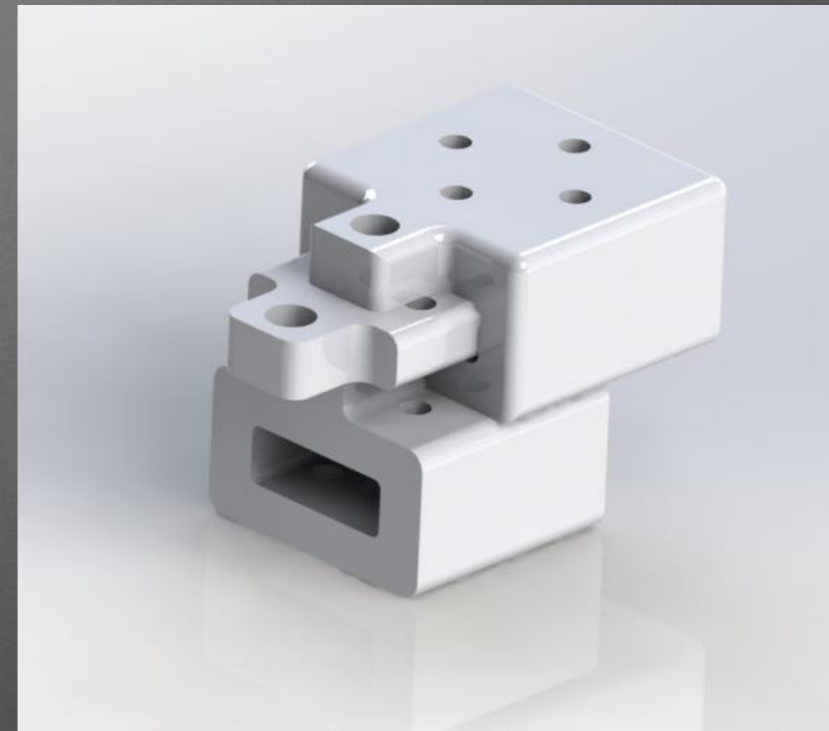
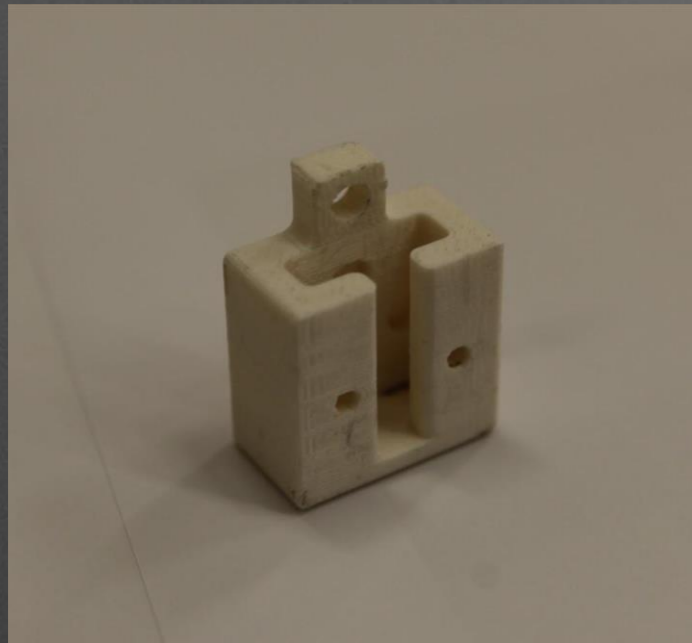


Circuit Board Mounting Structure
ABS Plastic



Cable Guide
ABS Plastic

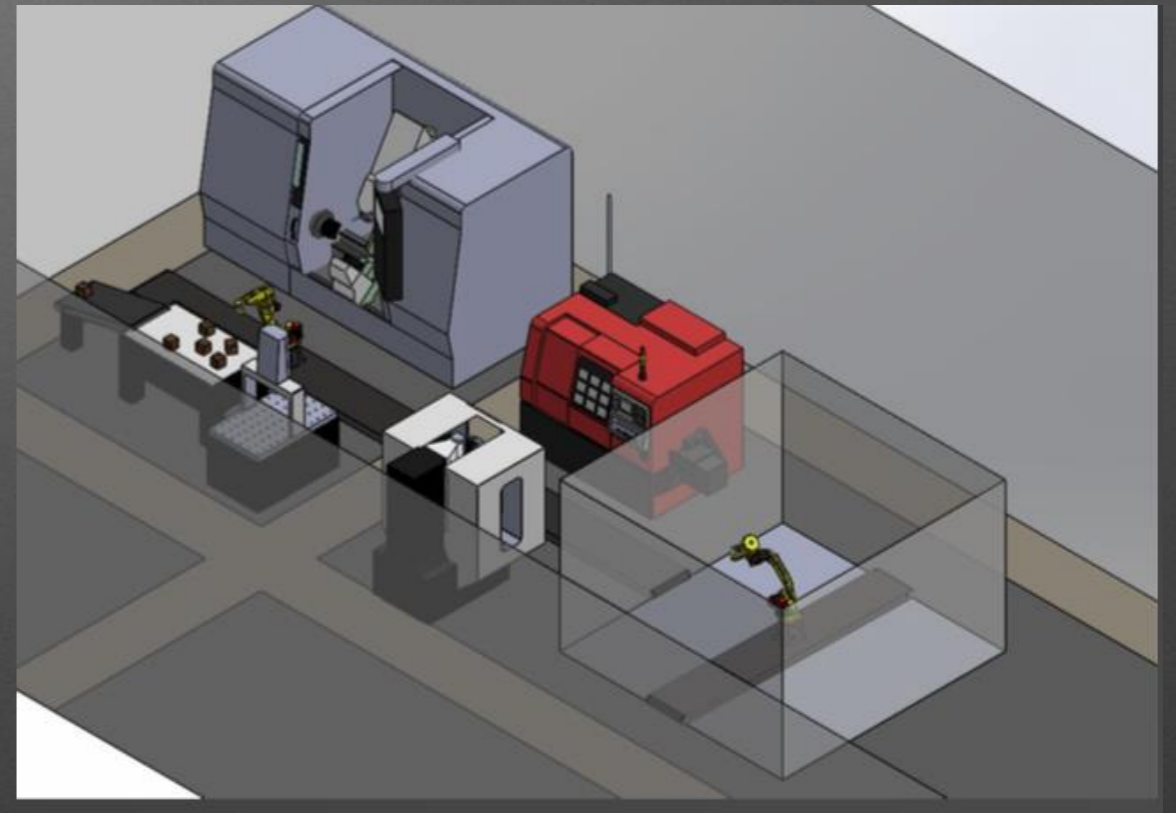
Interchangeable Head Design



- Major design feature
- Facilitate design, fabrication, and use of interchangeable heads
- Easier mounting/ dismounting Guide system
- Single Fastener

Applications

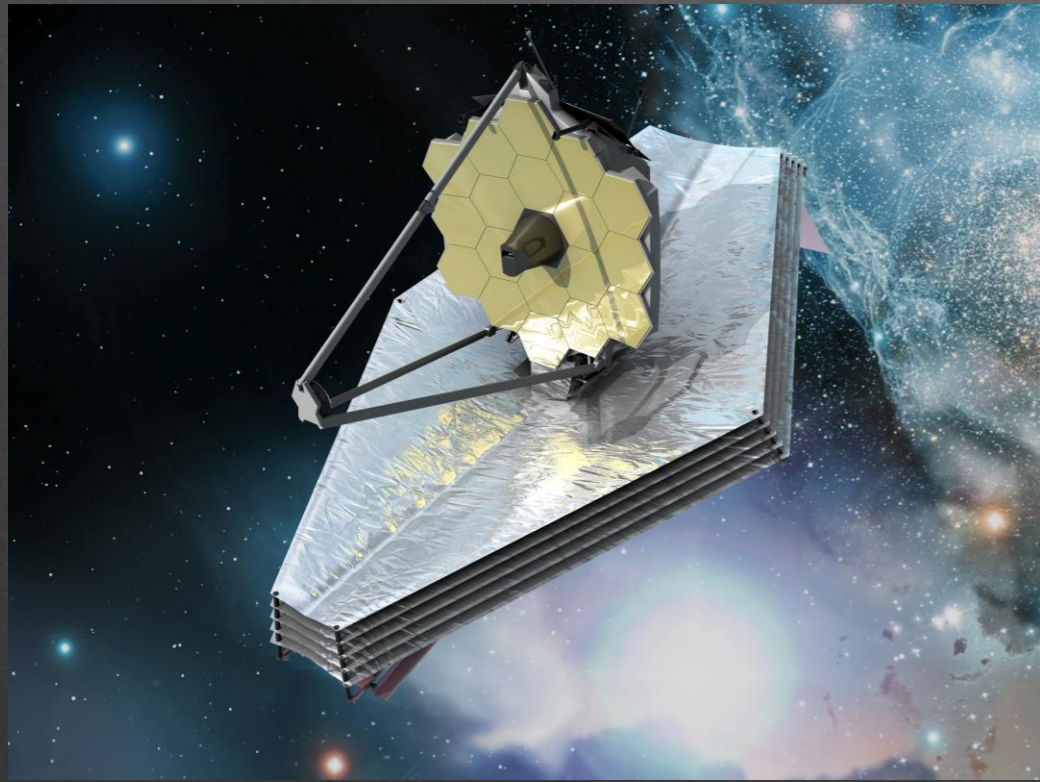
- The Advanced Manufacturing Branch is looking into the use of an industrial robotic arm.
- Another AMB intern, Megan Brown, is designing a space for two planned robotic arms
- one interfaces with parts
 - robotic arm that interfaces with parts takes a raw material to a machine to be fabricated, then takes it to a CMM (coordinate measuring machine) to verify quality, and then places it in a complete parts storage area.
- a freeform robotic arm
 - Could have an assortment of head attachments ones for welding, additive manufacturing, machining, or assembly.



Hubble Telescope



James Webb Space Telescope



Acknowledgements

