

# Innovation Lab Technical Assistant At the Goddard Space Flight Center



# AMB

# ADVANCED MANUFACTURING BRANCH

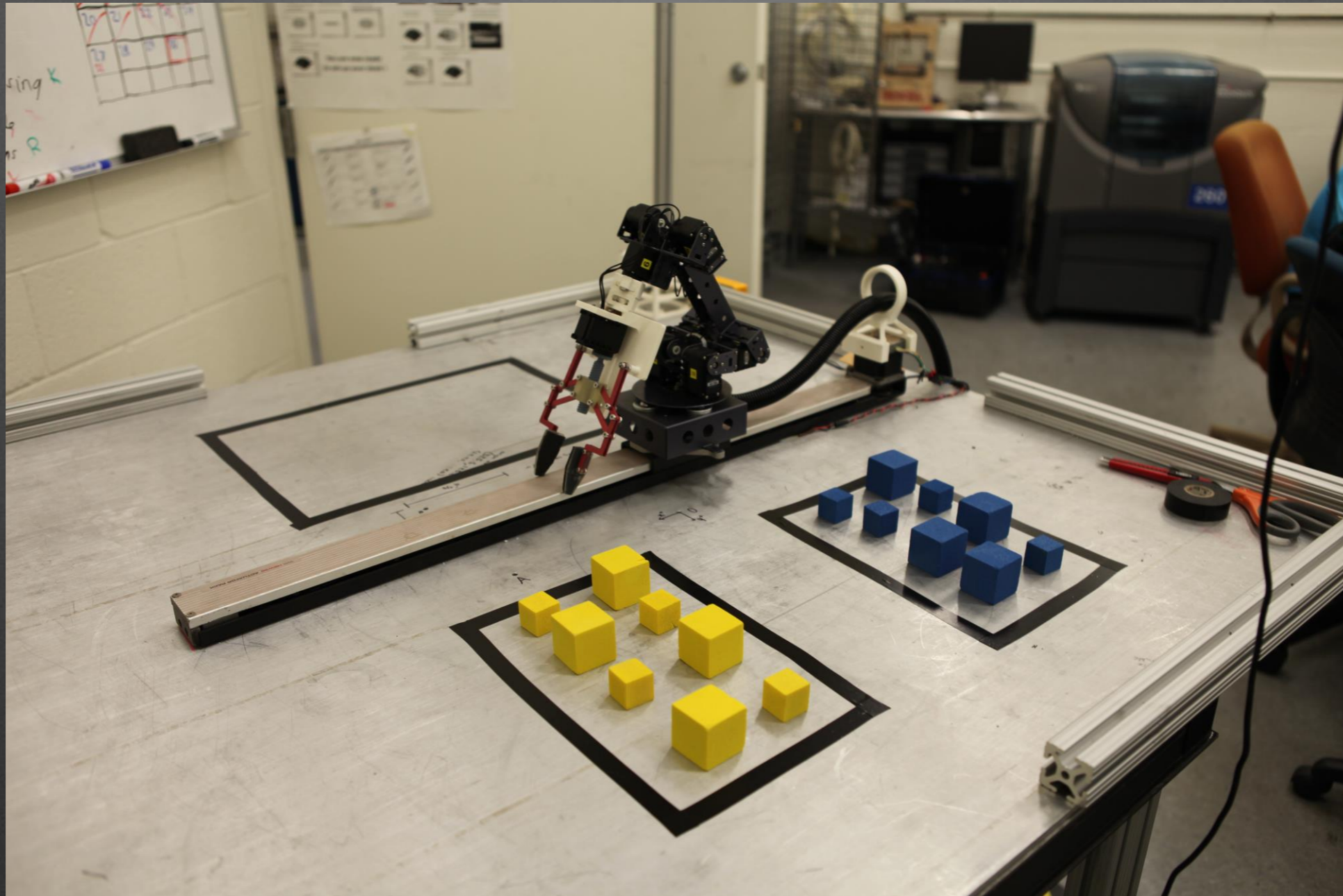
CODE 547



# Innovation Lab

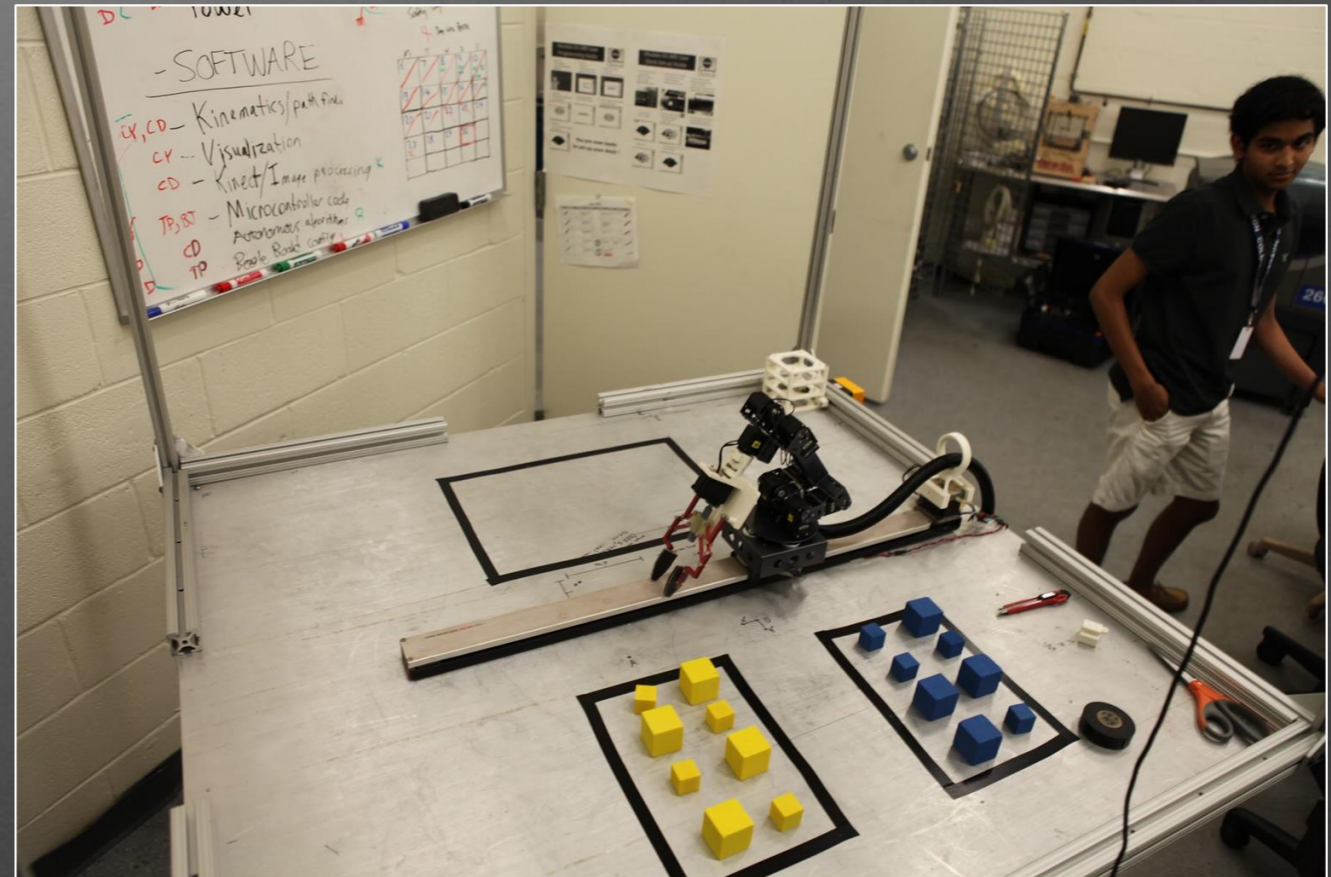


# Autonomous Robotic Manipulator System for Advanced Manufacturing (ARMS)

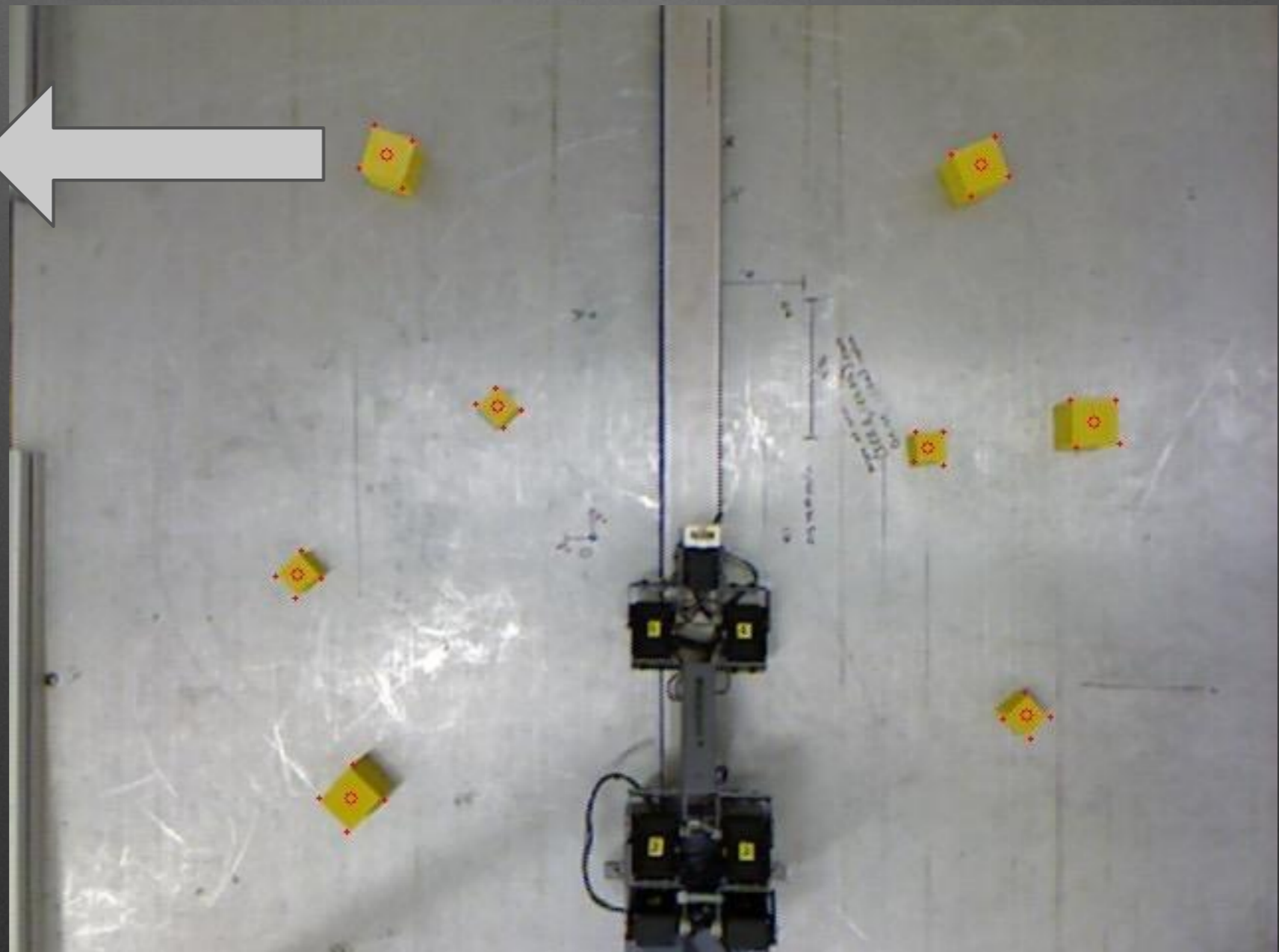
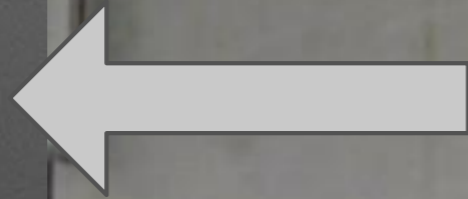


# System Overview

- 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

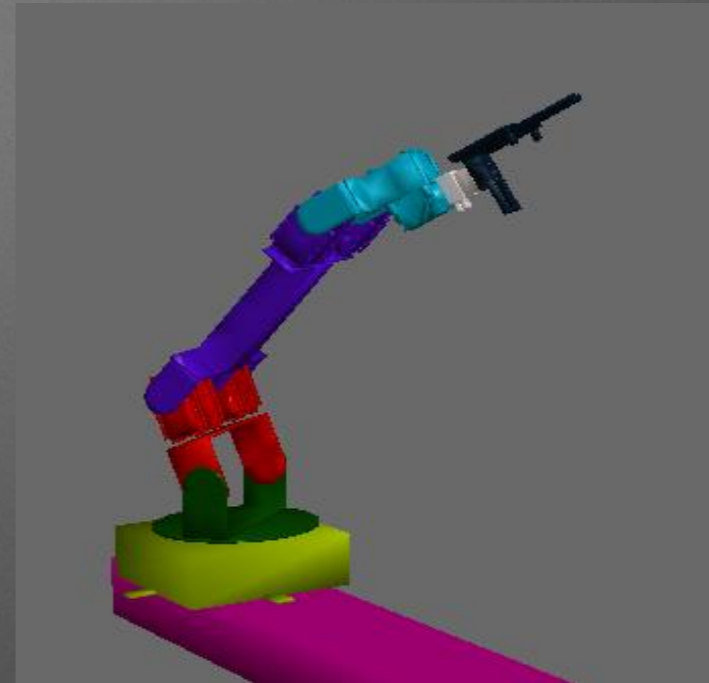


# Computer Vision and Kinect

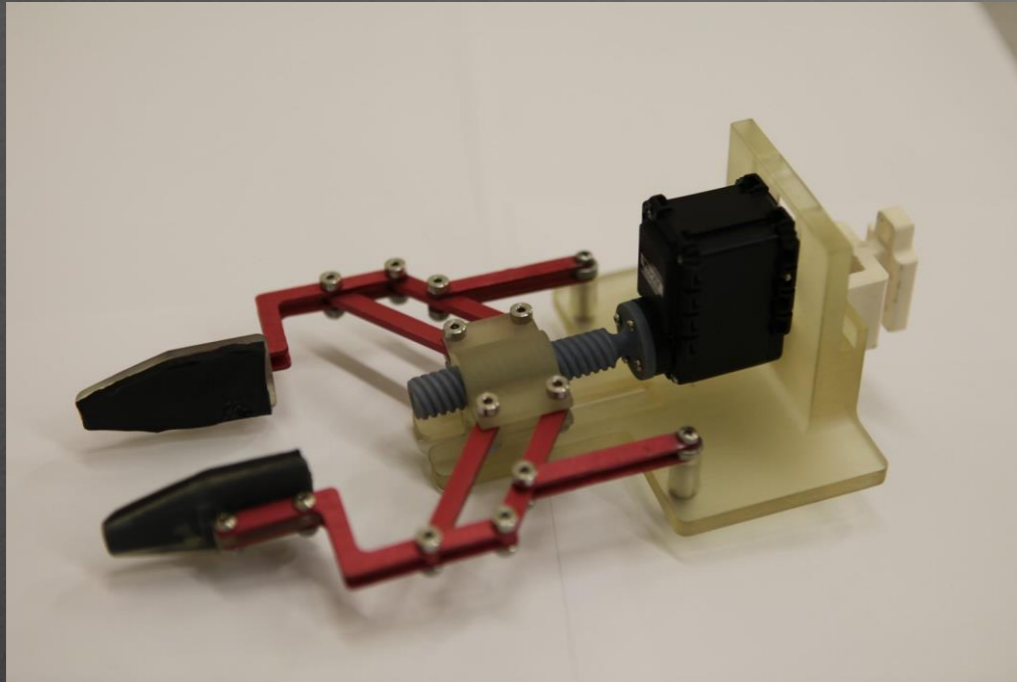


# Simulation

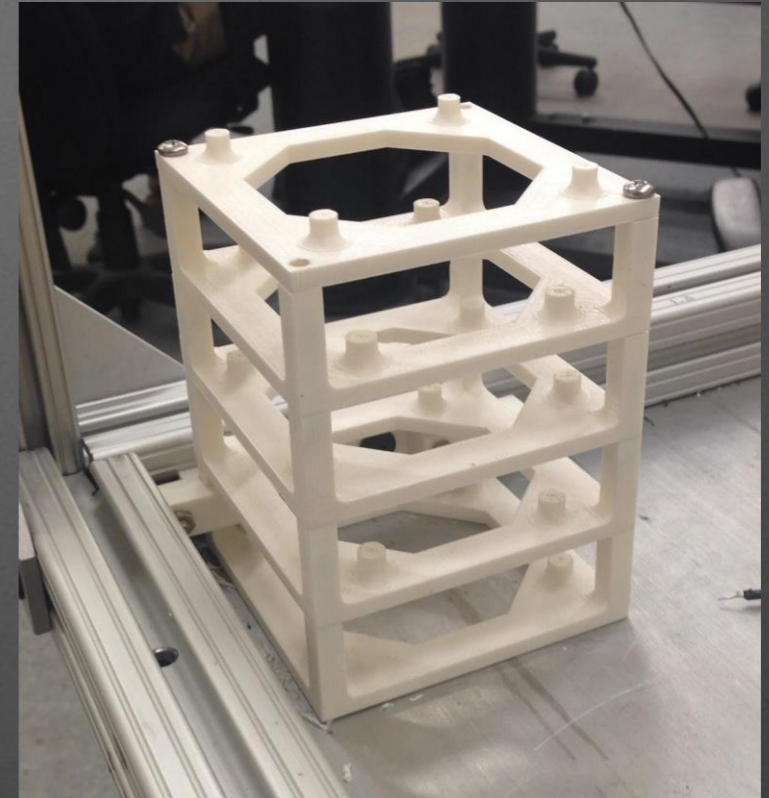
- Generated environments
- Non-destructive Simulation
- Projection of reality



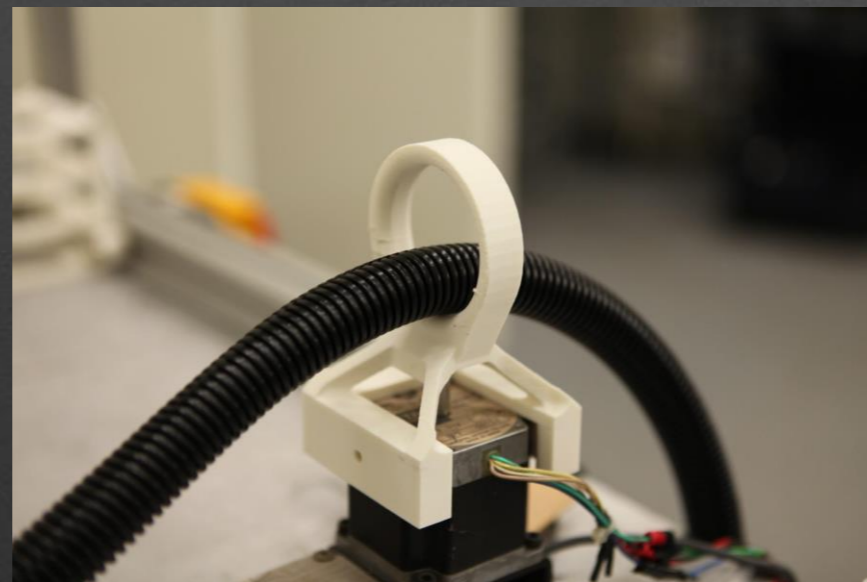
# Manufactured Parts



Claw Base Redesigned  
*Resin*



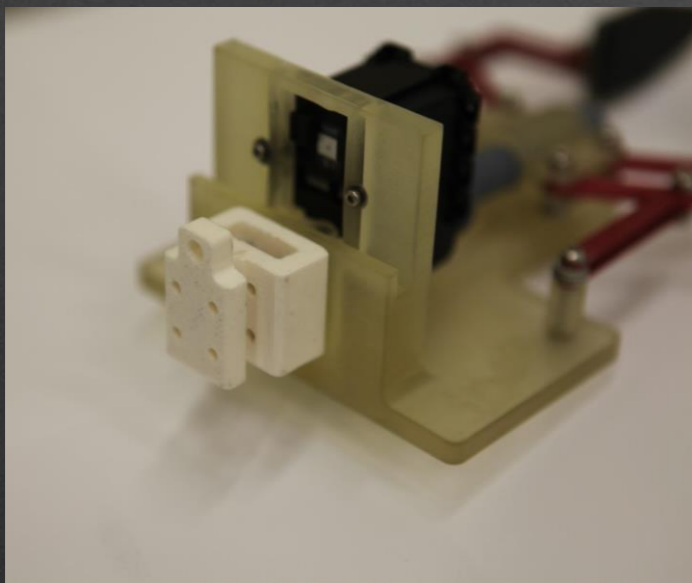
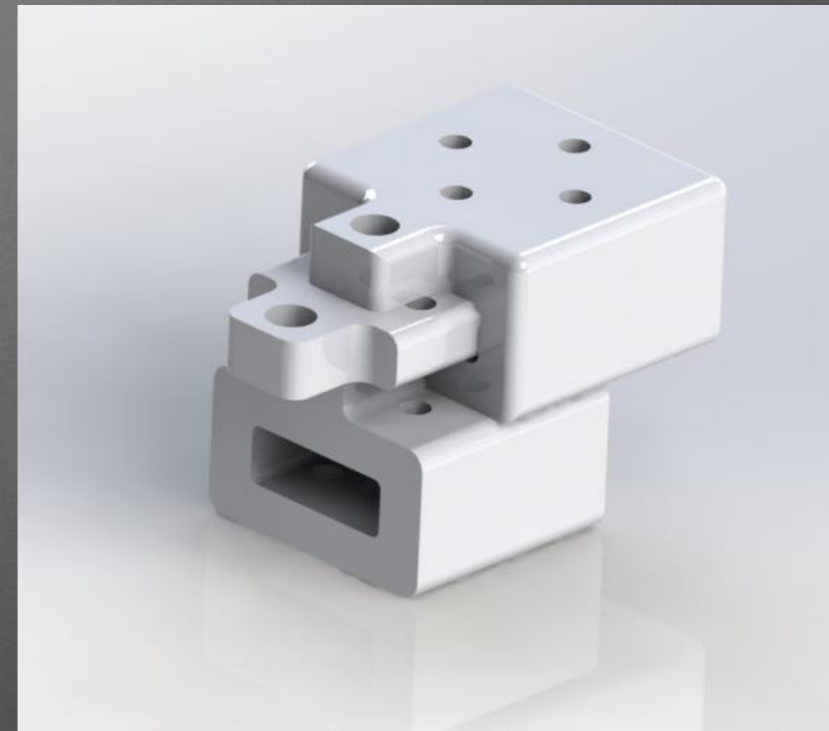
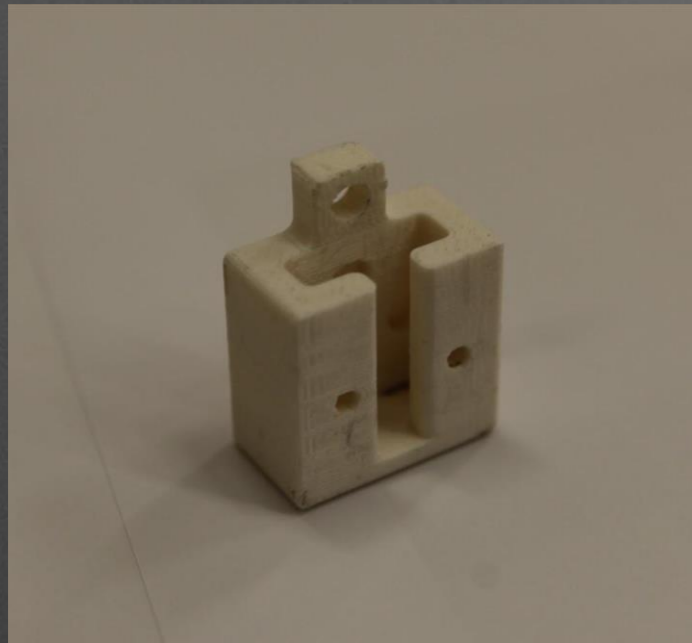
Circuit Board Mounting Structure  
*ABS Plastic*



Cable Guide  
*ABS Plastic*



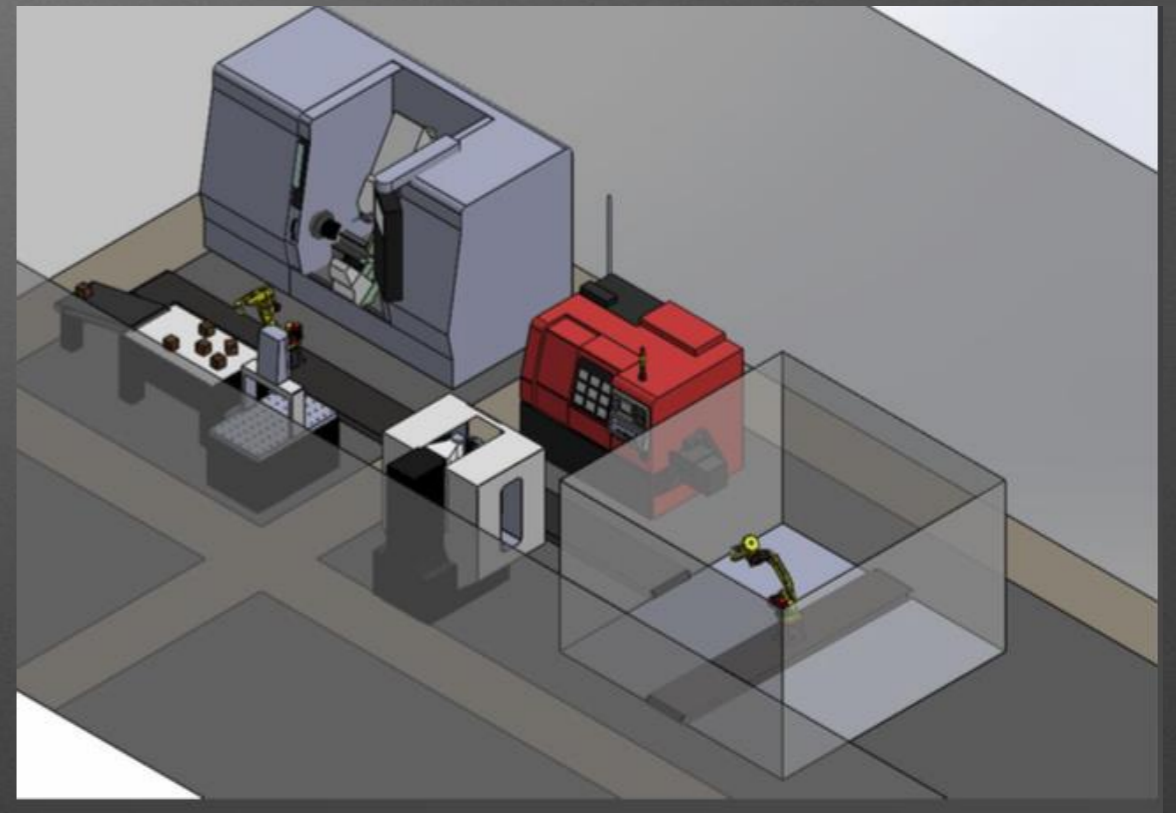
# Interchangeable Head Design



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

# Applications

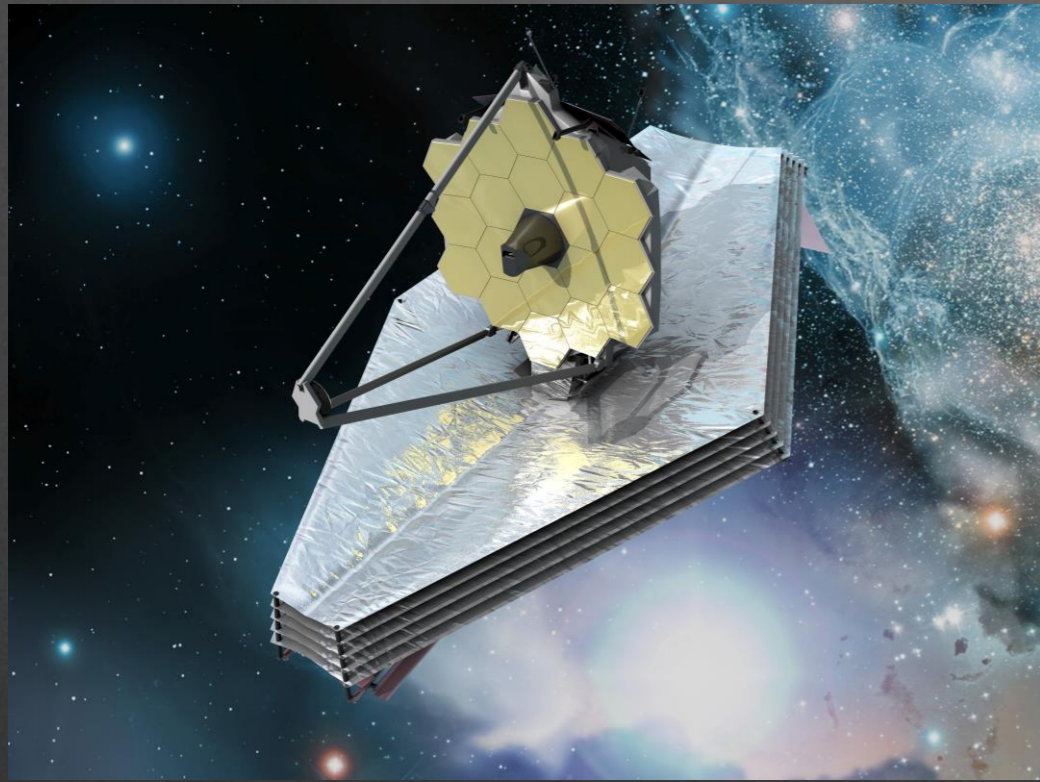
- The Advanced Manufacturing Branch is looking into the use of an industrial robotic arm.
- Another AMB intern, Megan Brown, is designing a space for two planned robotic arms
- one interfaces with parts
  - robotic arm that interfaces with parts takes a raw material to a machine to be fabricated, then 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

