Engineering Portfolio
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Design Portfolio Table of Contents:

Sealed Air ME Internship
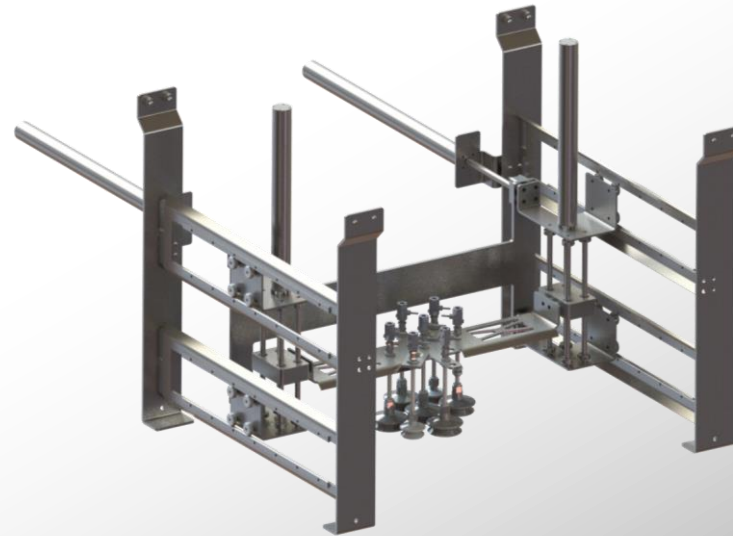
Artificial Intelligence Vision Rig

Key Features :

- Sheet Metal Design

- Tab/Slot Welds for Ease of Manufacturing

- Waterproof Electronic Housing

- Variable Height Mechanism

- Symmetrical Assembly

Sealed Air ME Internship

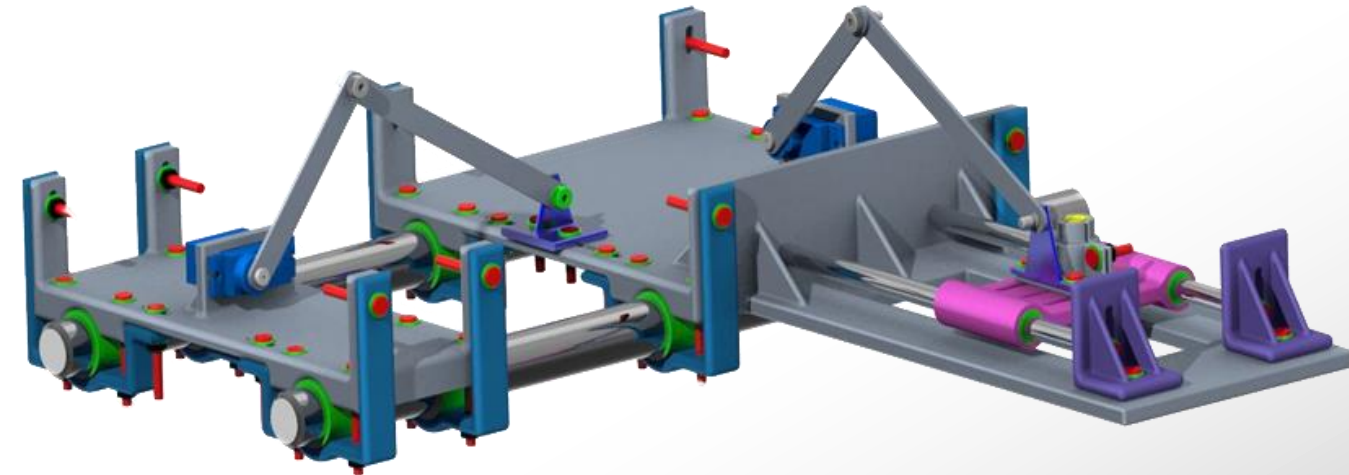## Dual Axes, Pneumatic Driven Quality Assurance Rig

Key Features :

- Sheet Metal Design

- Pneumatic Driven (Stacked-Axes)

- Tab/Slot Welds for Ease of Manufacturing

- Aids in quality assurance process for vacuum sealed bags

Binder-Jetting Mechanism for Z-CORP 510

<u>Undergraduate Research Design</u>:

<u>Key Features</u> :

- Additive Manufacturing Binder Spraying Mechanism

- Mounts to Z-CORP 510 Printer

- Slider-Crank Mechanisms

- Servo-Driven to Utilize Encoder and Code for Desired Positioning

- Arduino Code and Microcontroller

- Controlled Flow Rates by Investing in Syringe Pump

- Controlled Carriage Velocity

Senior Design

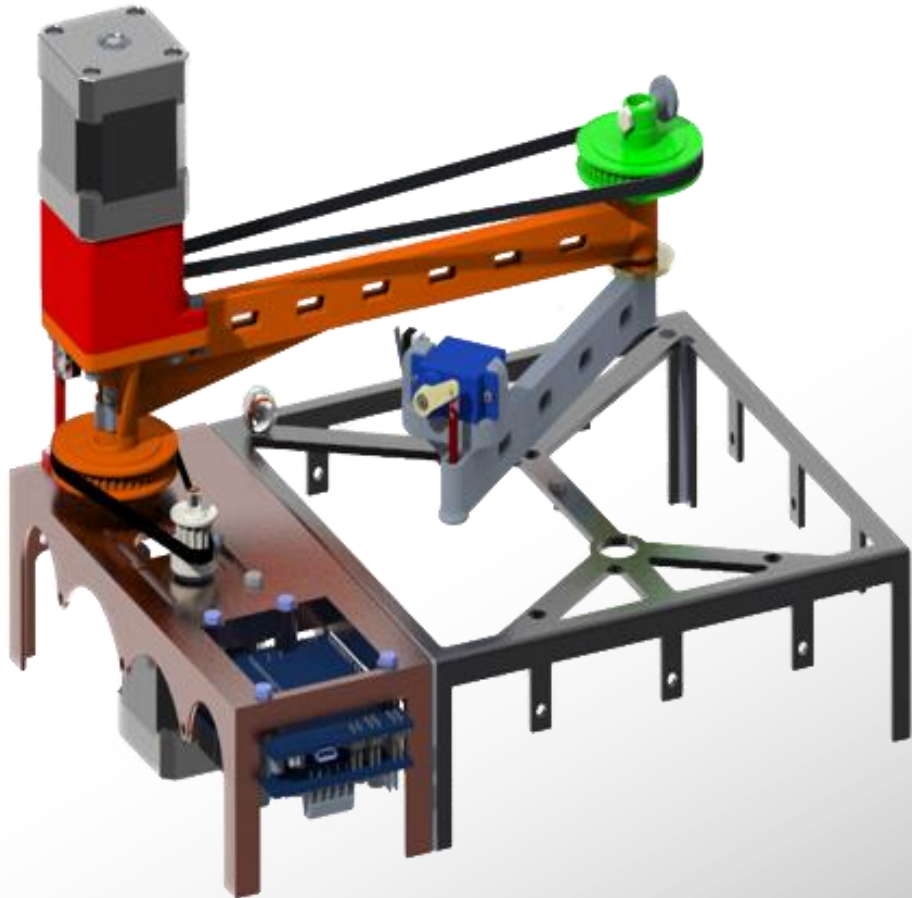## Retracting Ladder for Industrial Loader

Key Features :

- Hydraulic Powered Retractable Ladder

- Utilizes Welds and L-Brackets to Refrain from Cantilever Beam Scenario

- Improves Factor of Safety of Current Industry Design

- Retracts From Obstructions When Loader is in motion

- Utilizes Slotted Arc for Path of Travel

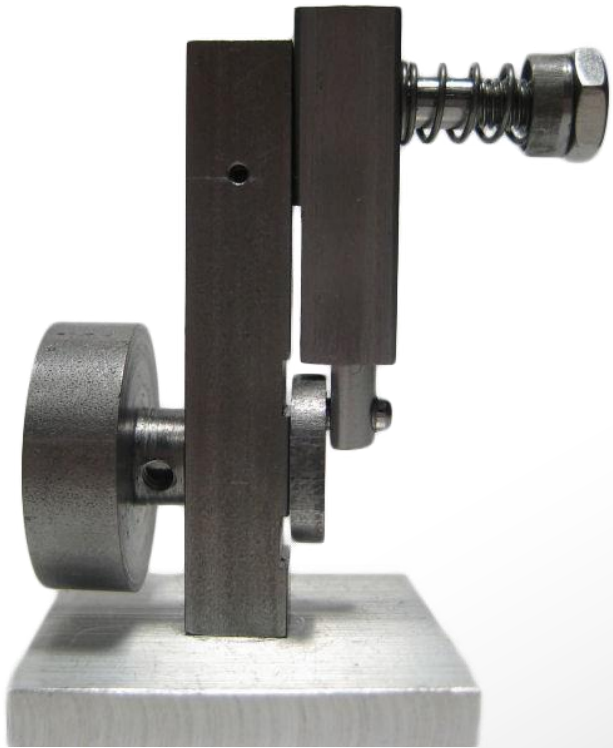# Junior Design

Pick & Place Robot

Key Features :

- Pick and Place 5 Steel Spheres to Designated Large Hole

- Utilize Arduino & Microswitches for Homing/Code

- Slider-Crank Gripper Assembly

- Stepper-Motors for Rotary Movement

- Utilizes Belt-Driven Pulley System

- Ranked 2nd Overall, Factoring In:
    - Cost
    - Weight
    - Elapsed Process Time

# Sophomore Design

## Machined Air Engine

Key Features :

- Utilize Machine Shop to Fabricate Tight Tolerance Air Engine Over Course of Semester

- Familiarize with Mill, Lathe, Drill Press, Grinding Wheel, Vertical/Horizontal Band-Saw, etc..

- Required to Surpass 6500 RPM'S at 80 PSI
  - Personal RPM: 7120 RPM

- Required to Run at 5 PSI

Plastic Part Design: Raspberry Pi Case

Injection Molded Raspberry Pi Case
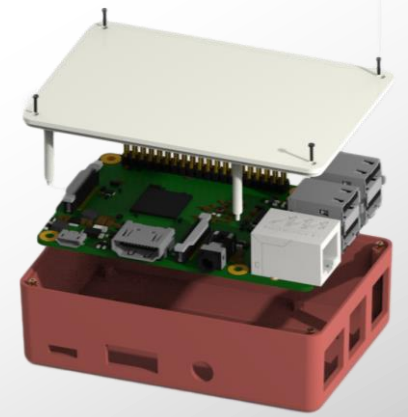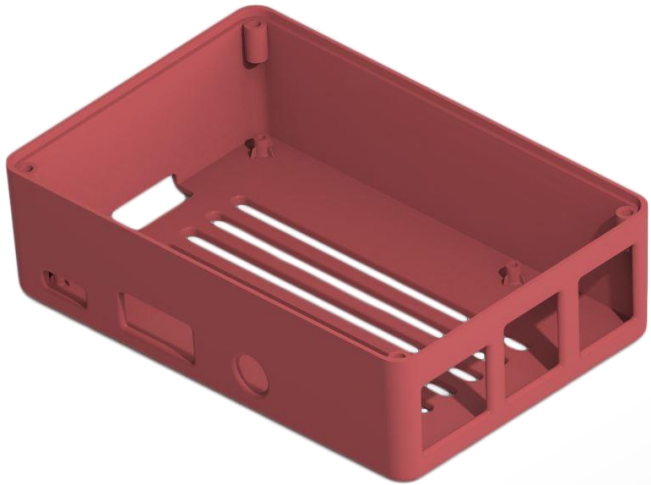
Key Features :

- Applied learned concepts of Injection Molding Process to Design of Raspberry Pi Case

- Design for Injection Mold

- Tested Thermal Analysis of Process for Verification of Proper Design

- Cost-Effective

- Heat Vents for Proper Transfer of Heat Generated From Raspberry Pi

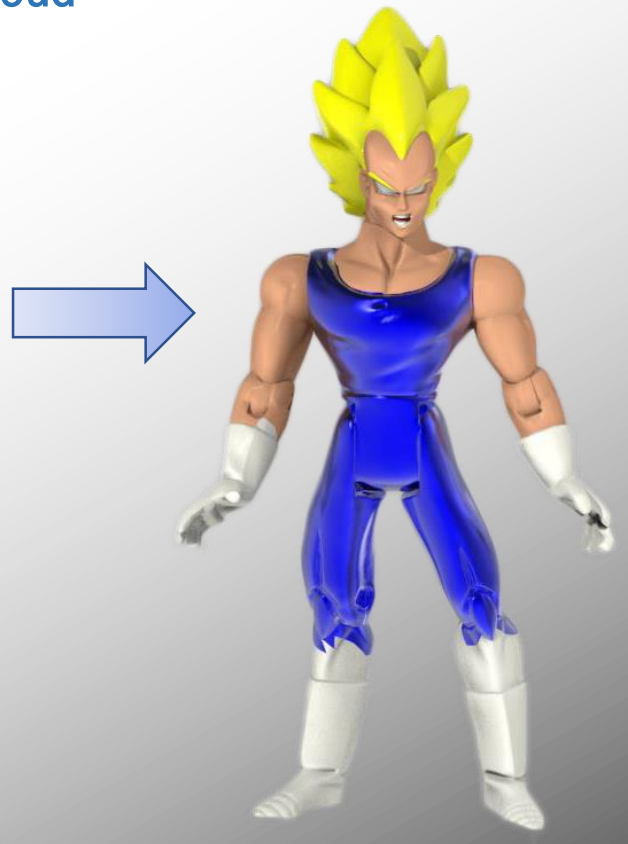# Advanced CAD/CAM

Reverse Engineered Action Figure (Geomagic)

GOM 3D Scanner

Geomagic 3D Point Cloud
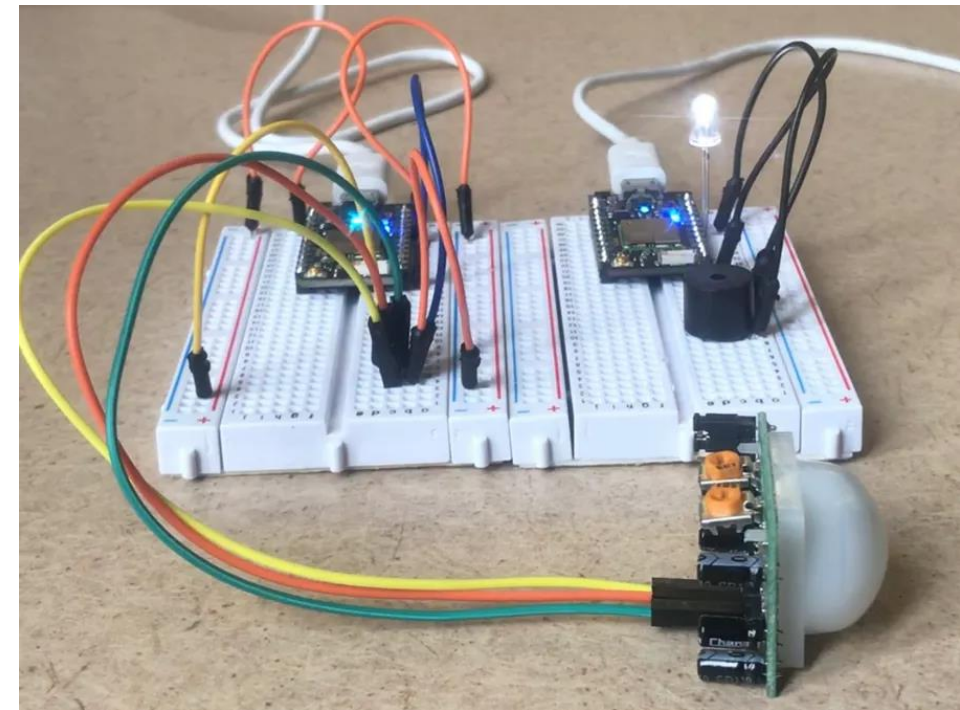
Converted CAD Model

Key Features :

- Reverse Engineering Product Using Geomagic Software and GOM 3D Scanner
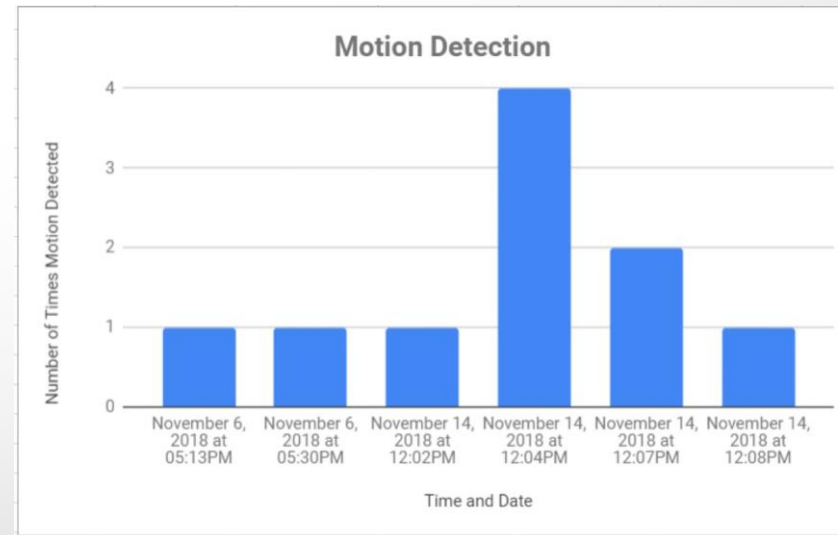
- Converted to Working CAD Model

Instrumentation IOT Design

IOT Security Motion Sensor

Motion Detection

Key Features :

- Photon Particle IOT

- C++ Programming Language

Youtube Live Video

https://www.youtube.com/watch?time_continue=3&v=WzGc7AX7Cgs

Full Detail How-To Page

https://www.hackster.io/iot-36/megr-3171-fall-2018-security-motion-sensor-1fa32d