

PathVision

Team 27

Emily Hernandez, Alex Domagala, Pranay Singh, Jon Perthel



Computer Vision in the Real World



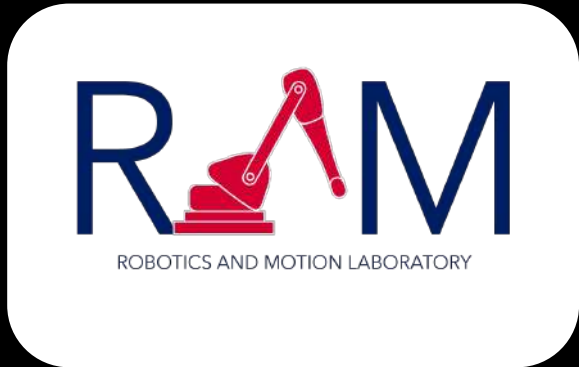
SPOT® Conducting Safety Check



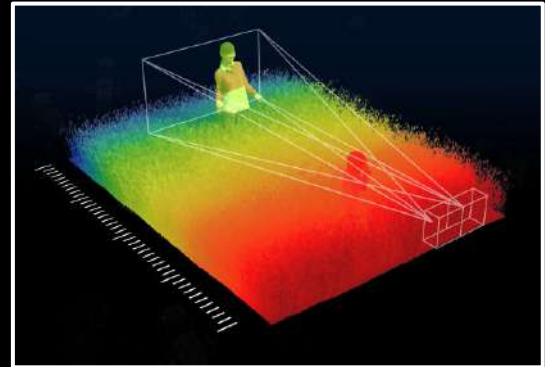
Computer Vision



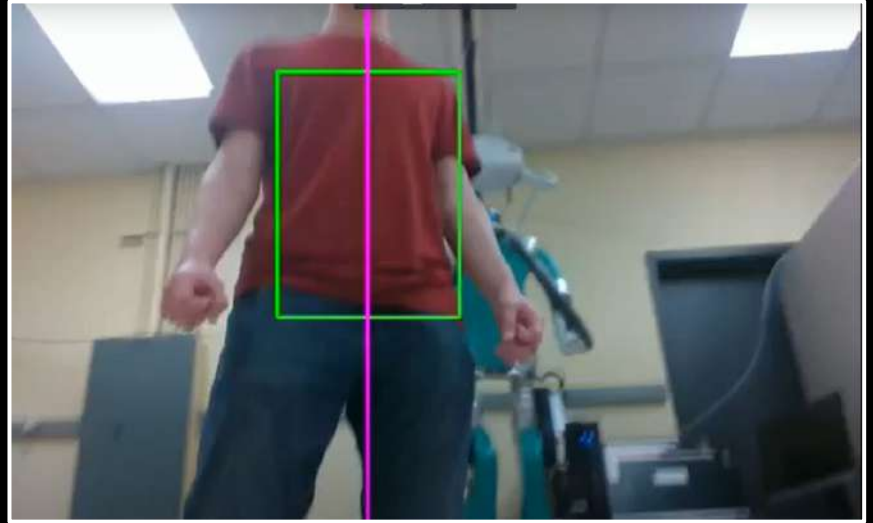
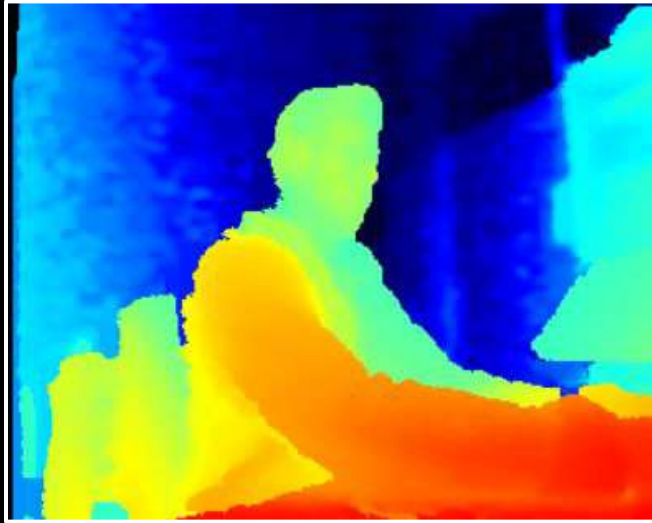
Autonomous Upgrades



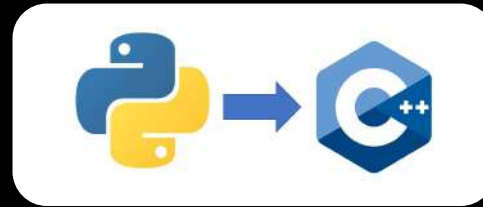
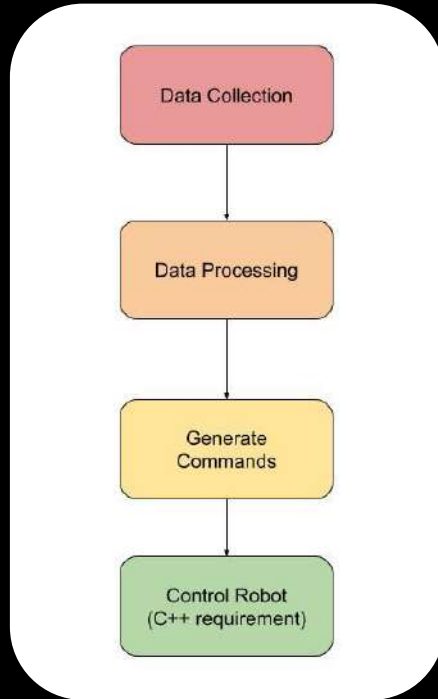
+



Depth Maps and Object Tracking

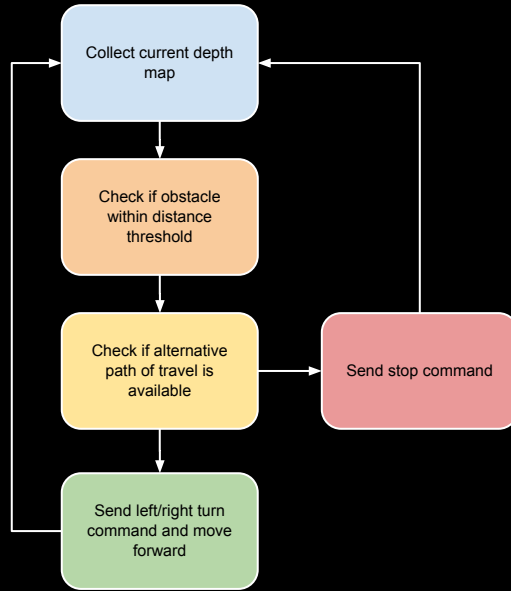


Software Design

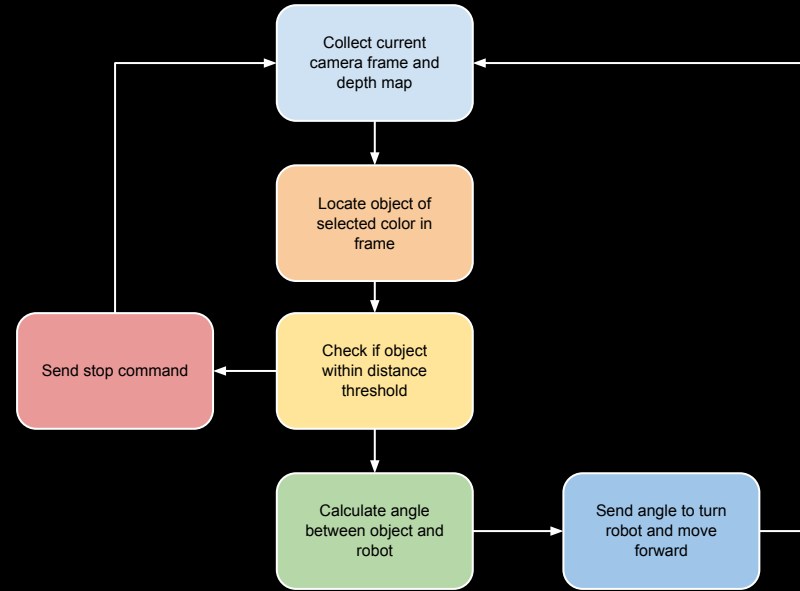


Software Flow

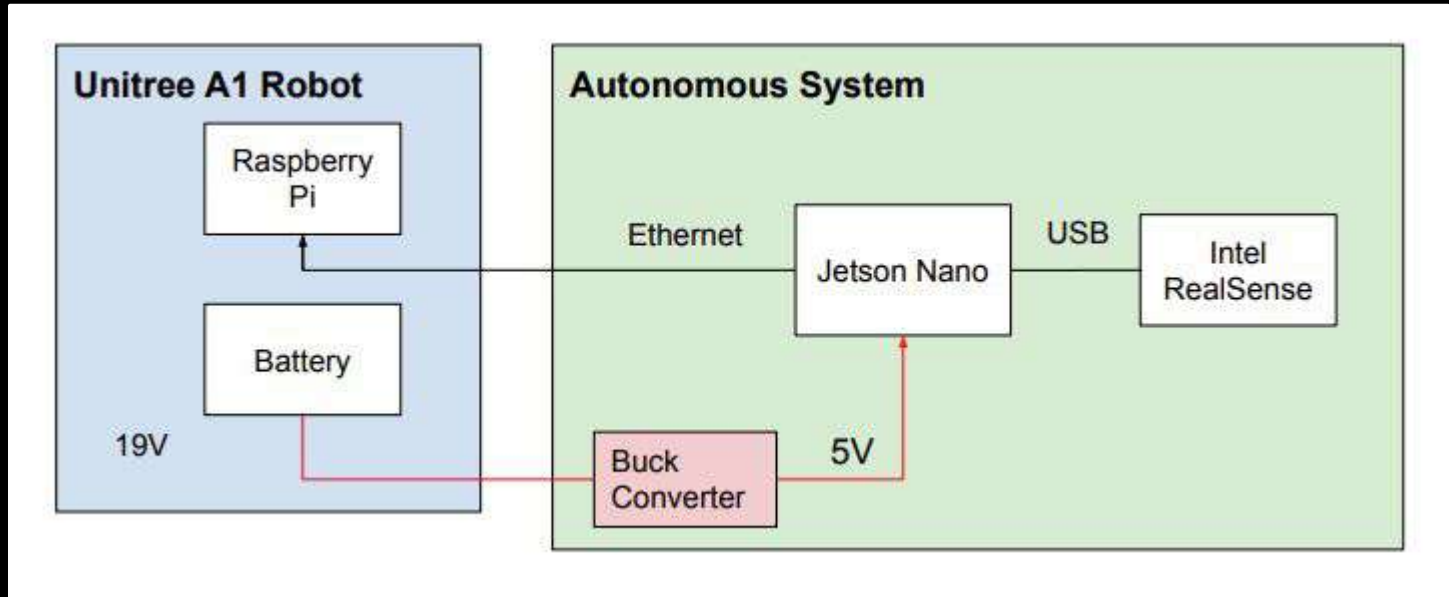
Obstacle Avoidance



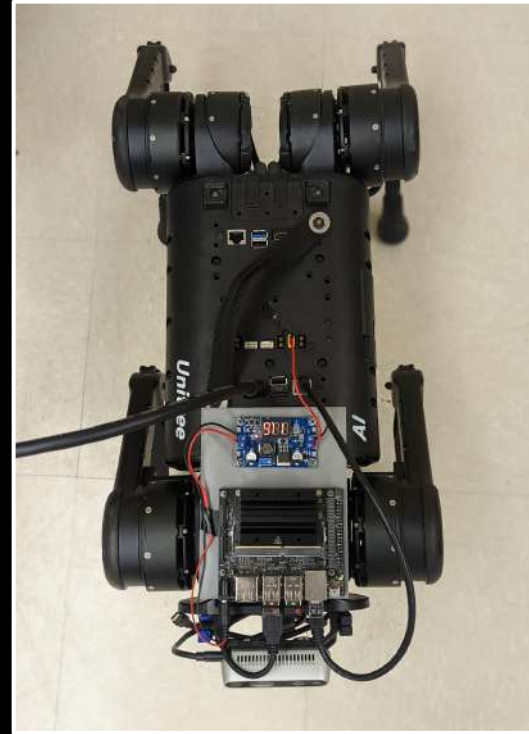
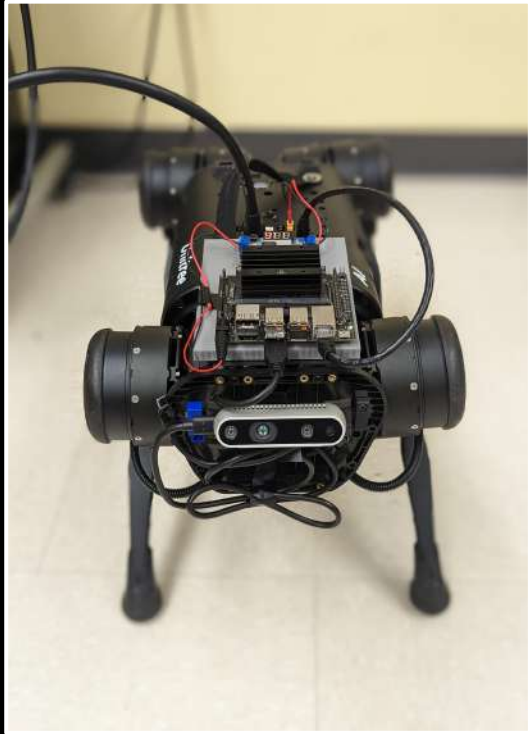
Object Following



System Design



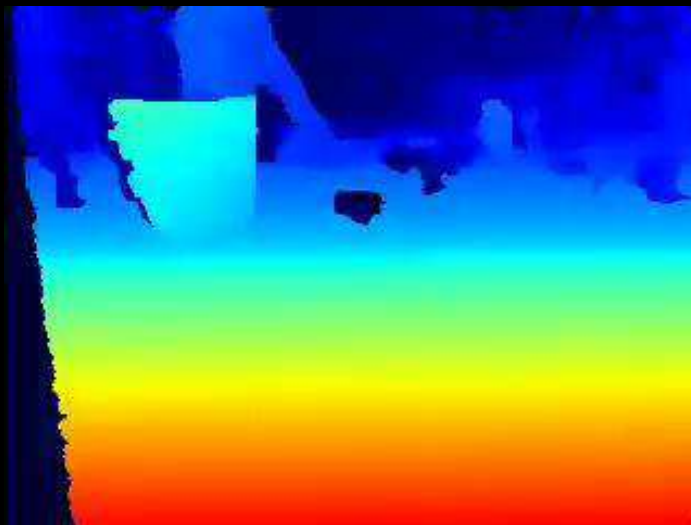
Robot Hardware



Software Controlled Movement



Obstacle Avoidance



Object Following



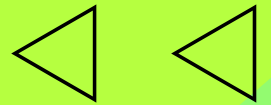
The PathVision System

- **Final functionality**
 - Obstacle Avoidance
 - Object Following
- **Cost**
 - PathVision System: \$304

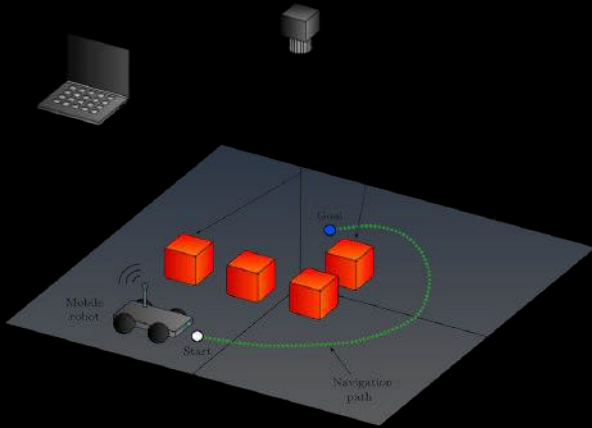




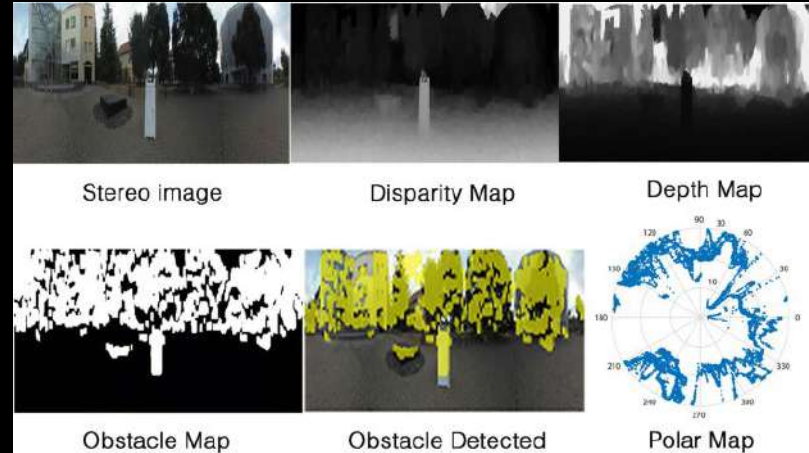
Appendix



Desired Capabilities



Robot Obstacle Avoidance



Obstacle Detection



Design Alternatives

Microprocessor

NVIDIA Jetson Nano



BeagleBone AI



ROCK PI N10



Vision System

Intel RealSense D435



Logitech C270



IMX219-83

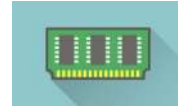


Comms Link

Ethernet



SPI



I2C



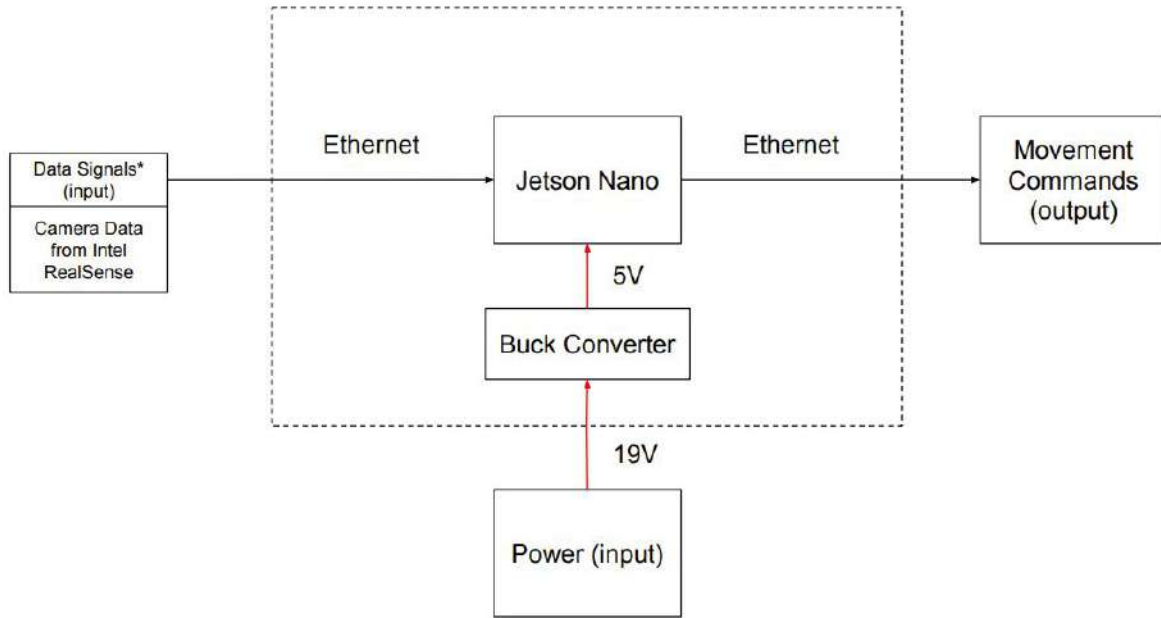
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Level 1 Diagram



Design Alternatives

Microprocessor

NVIDIA Jetson Nano



Raspberry Pi 4



BeagleBone Board



Vision System

Intel RealSense D435



Logitech C270



IMX219-83



Comms Link

Ethernet



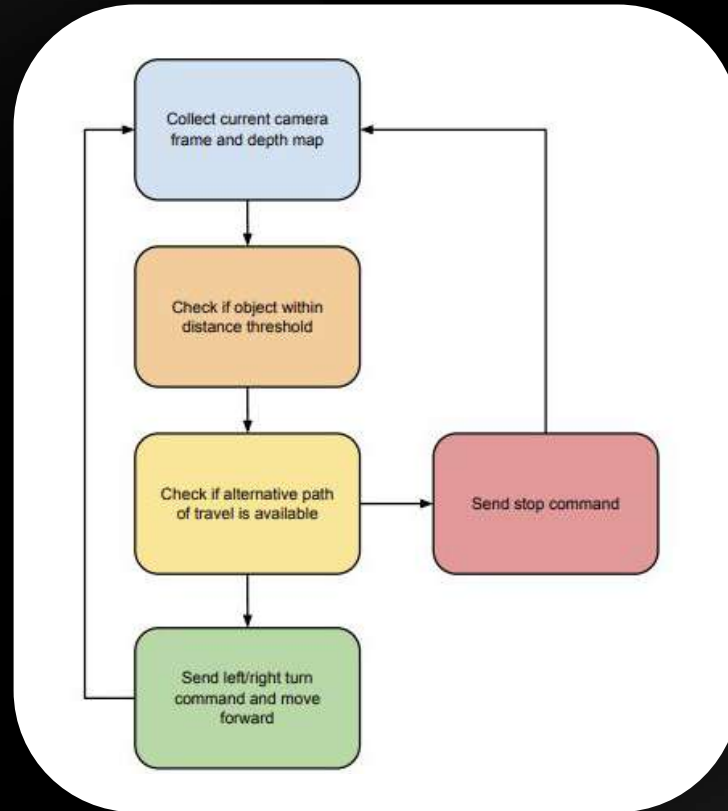
SPI



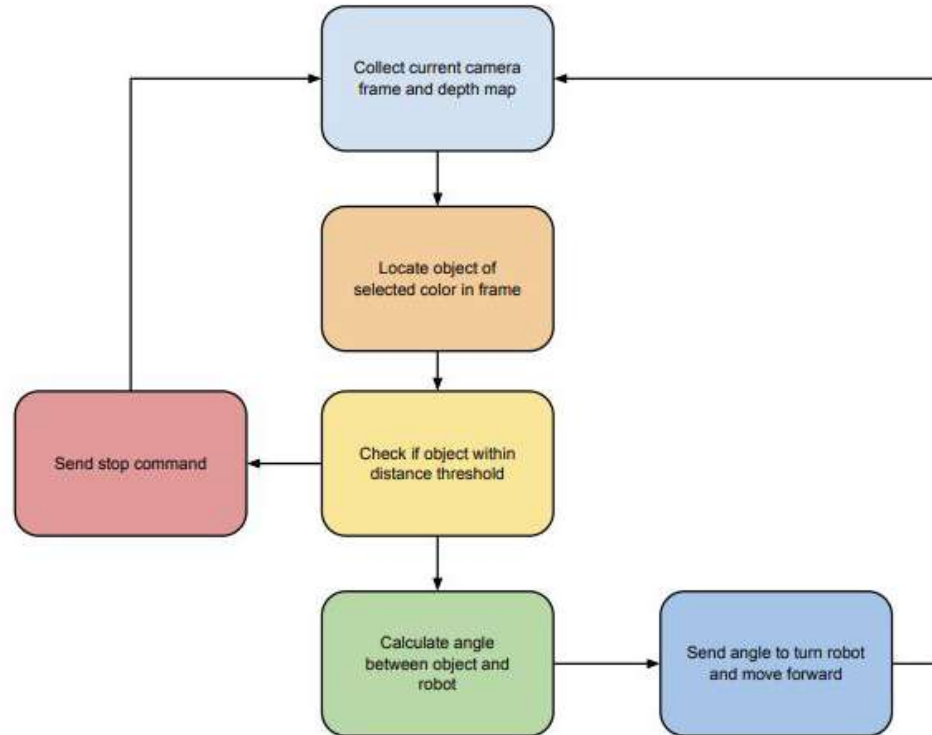
I2C



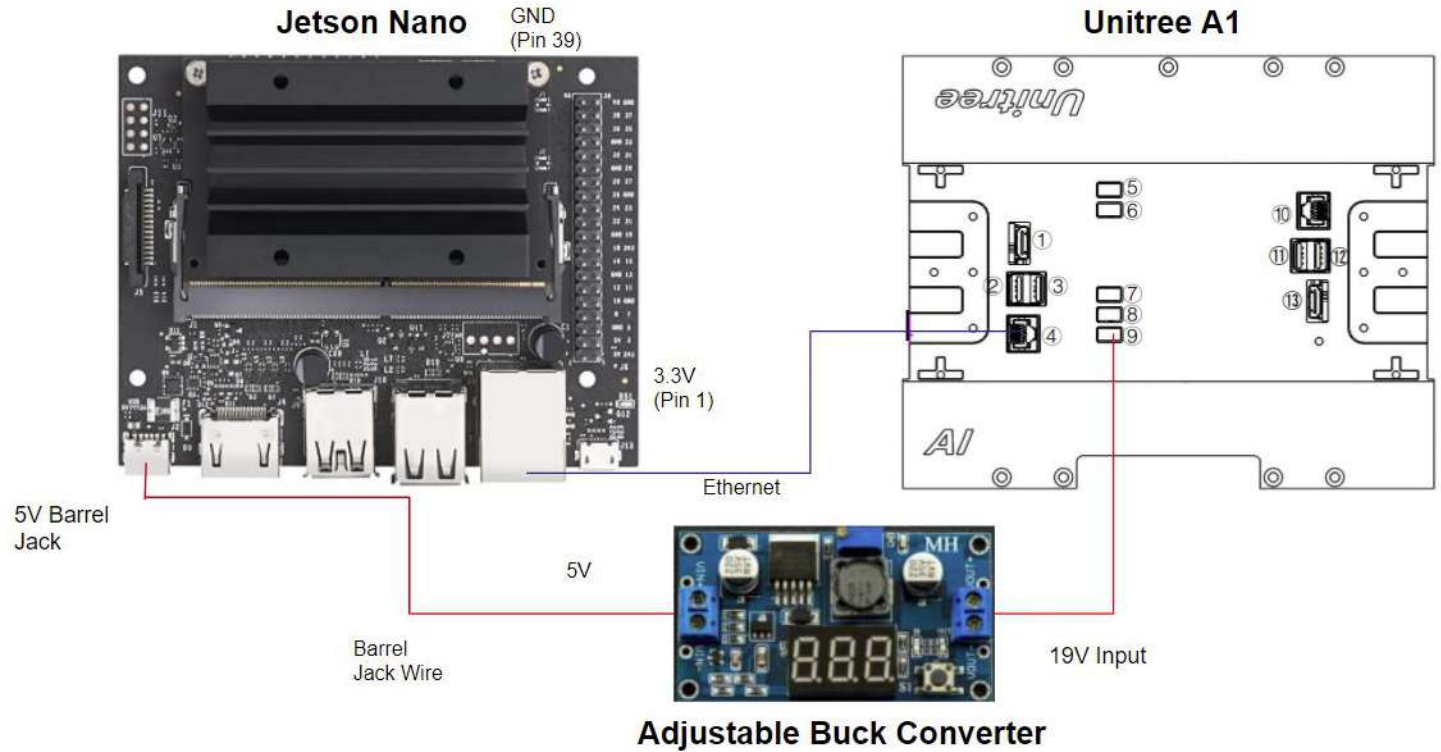
Obstacle Avoidance Flow Diagram



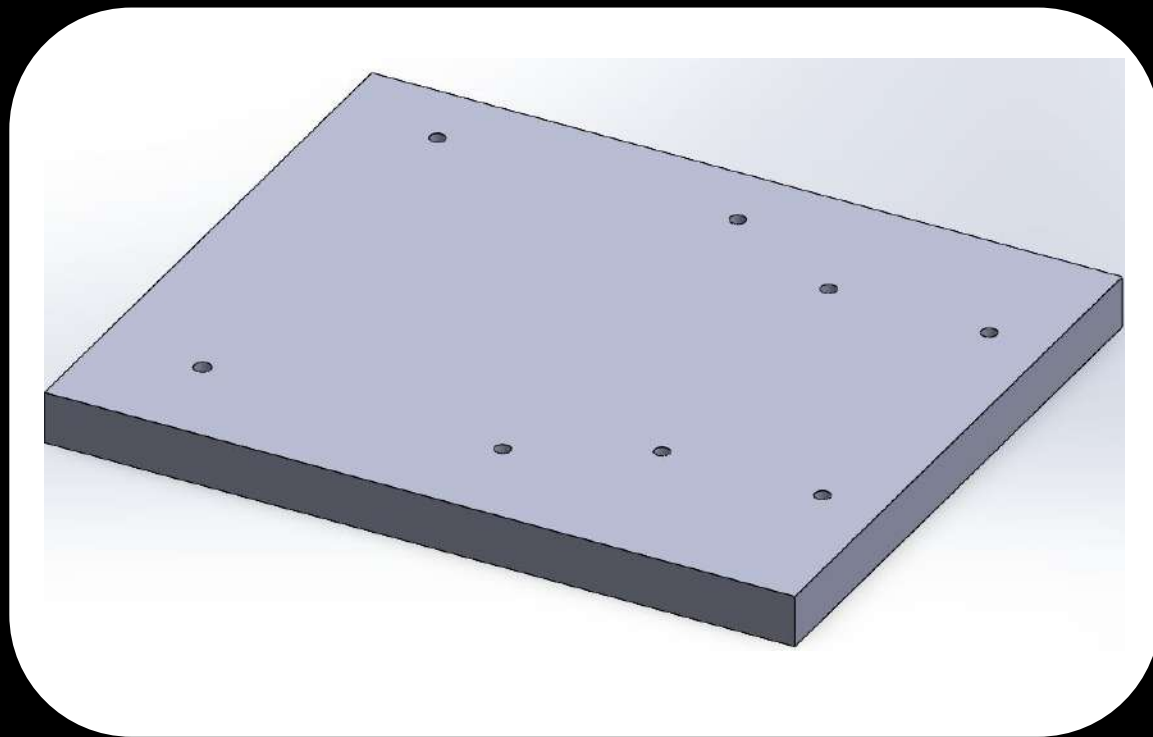
Object Following Flow Diagram



Circuit Schematic



Custom Mount



GitHub Link

<https://github.com/jonathanperthel/PathVision>

