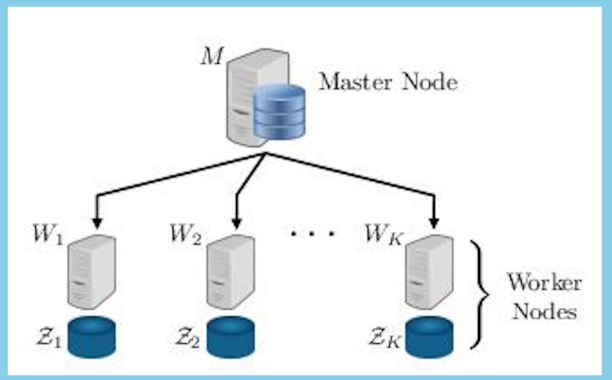
Smile Cloud? Mobile Distributed Computing

Sky Johnson | Fate Alexis Lumba | Jed Vargas | Joseph Omengan | Jayson Del Moral | Evans Nik Matabwa | Ben Leeds

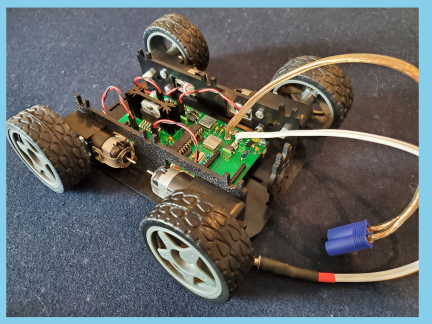
Overview:

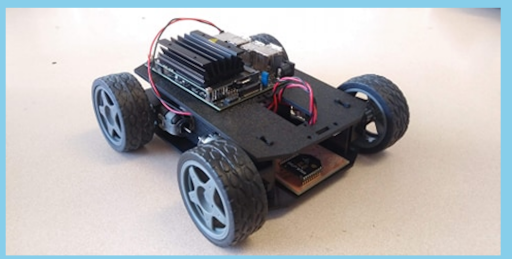
Large matrix computing tasks such as object detection often too much for one UGV to handle. Such tasks must be computed off site then sent back to UGV.

Our project will solve this problem with distributed computing amongst smaller, cheaper UGVs.



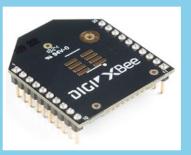
Product Visual:



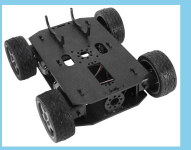


Key Hardware Components:

Jetson Nano - Main onboard computing unit. Quad core, 5V power supply.



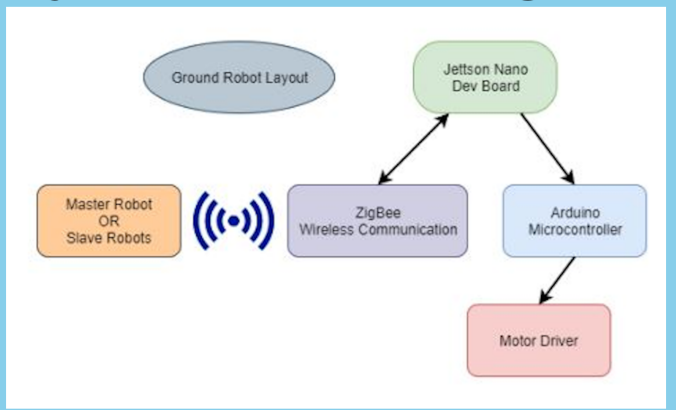
XBee 3 - Comunication device between the UGVs. Compact, indoor range up to 200ft.



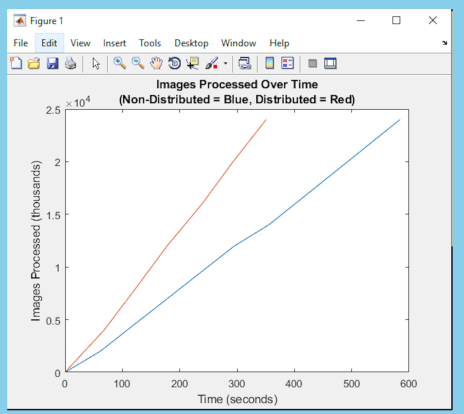
Junior Runt Rover - UGV chassis. 4 motor powered wheels, controlled by arduino.

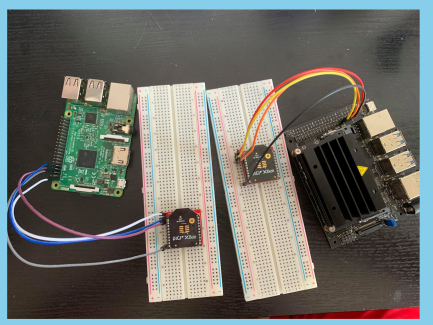
Raspberry Pi Camera - Runs TensorFlow Lite Object Detection Models on Raspberry Pi

System Block Diagram:



Key Results:





Distributed image processing comparison.

XBee 3s interfaced and able to communicate with each other.

PCB with motor controller to assist in UGV mobility.

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Team 46

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