Standalone Security Camera Network

GROVE CITY COLLEGE

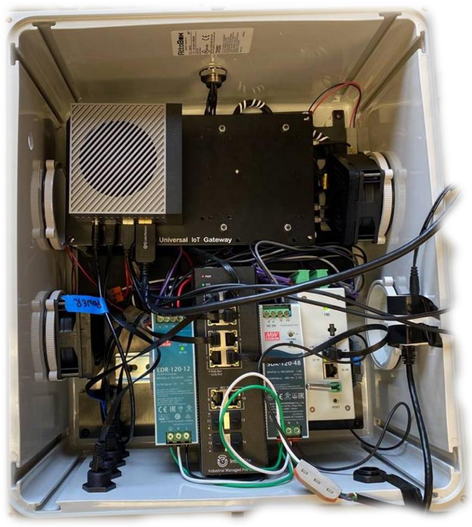
orbital ENGINEERING, INC.®

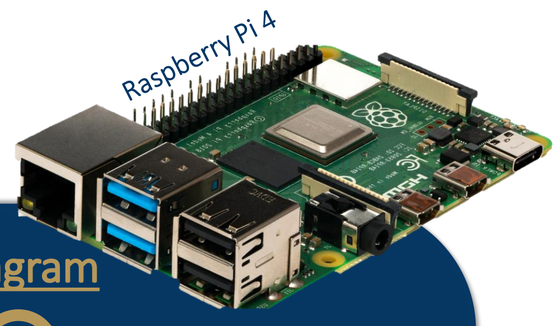
Objective

Create a camera network that can communicate multiple camera feeds to one Hub station from different locations around a laydown yard. Each camera must be able to function for 30 days continuously via battery and solar power.

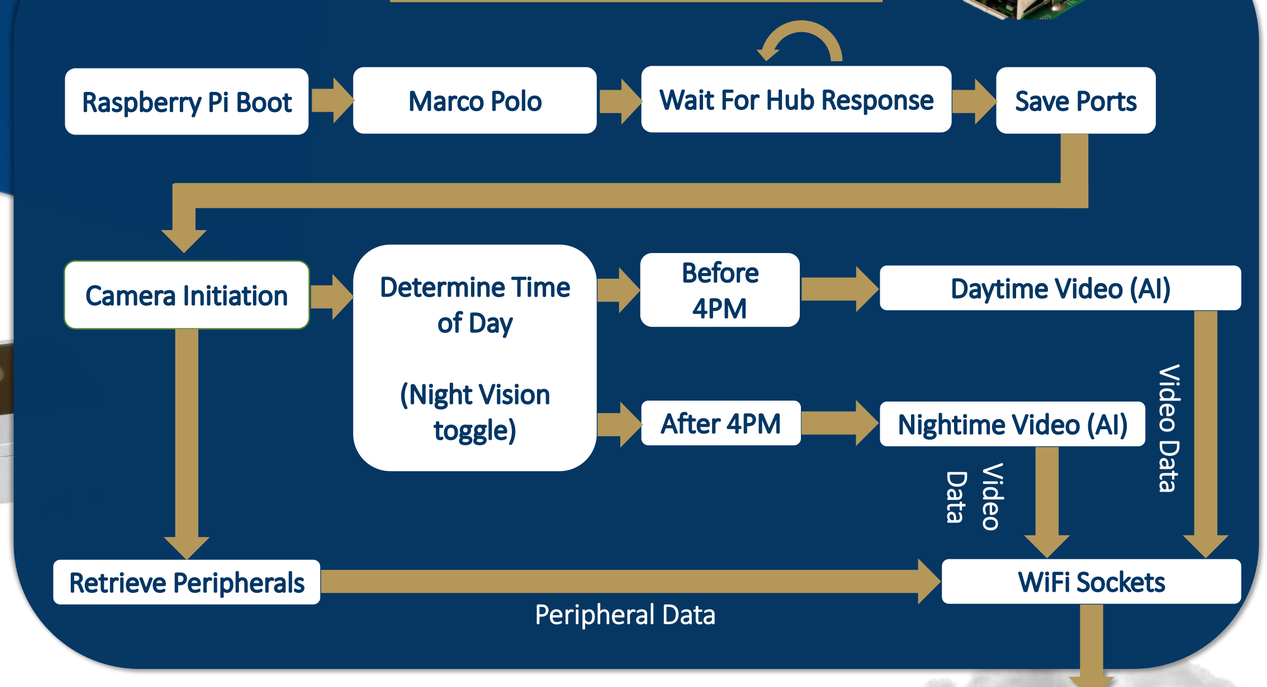
Design

A 60 Ah battery bank powers the system overnight after which a solar panel recharges the system during the day. A Raspberry Pi4 handles communication between the hub and each camera while adding AI detection tracking. Peripherals such as an ADC and GPS were added for extra functionality and data recording.





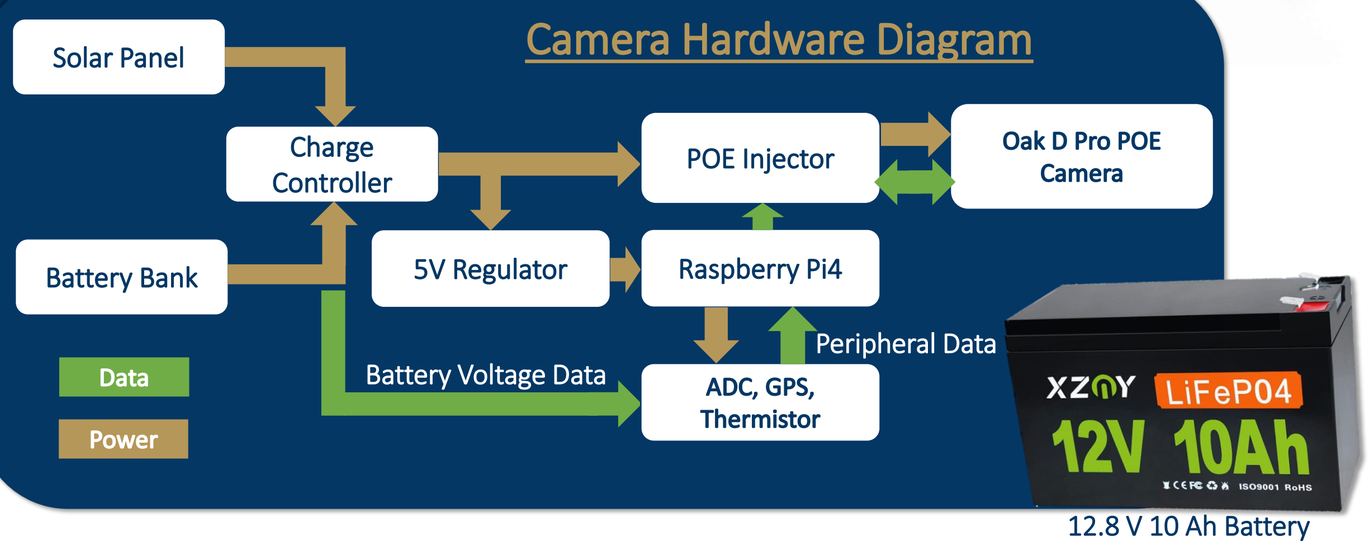
Camera Software Diagram



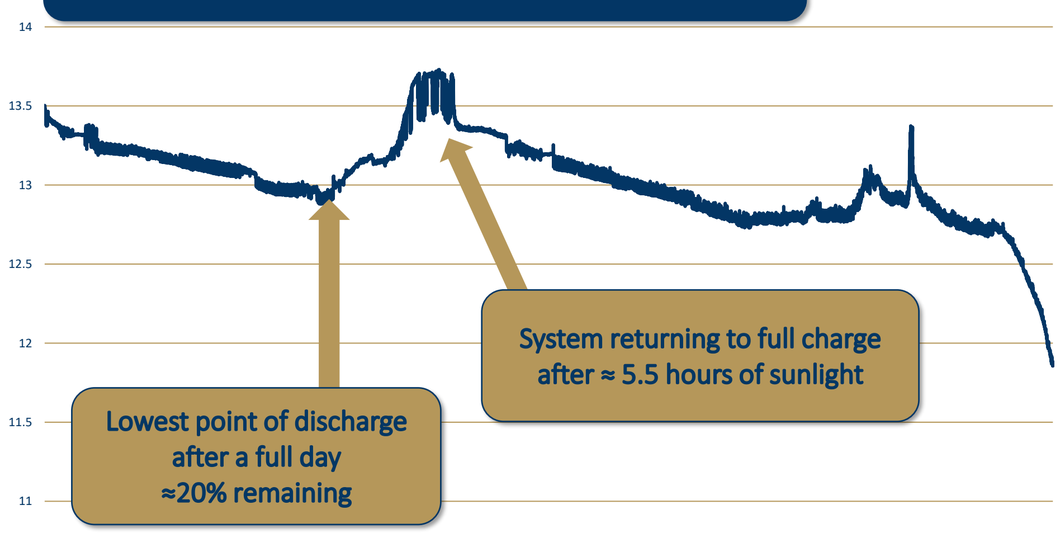
Deploying the system outside; the system is being charged through the solar panel.

Luxonis OAK-D Pro POE

Camera Hardware Diagram

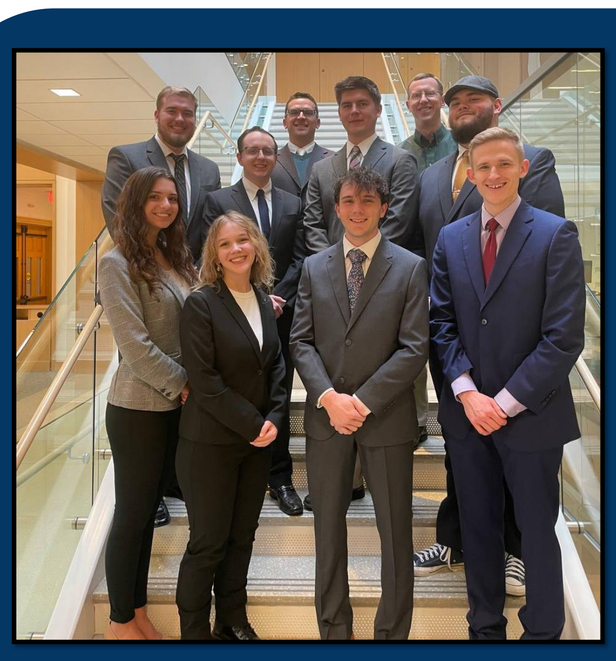


12.8 V 10 Ah Battery



Results

The system has been deployed and proven to function while transmitting both peripheral and video data back to the hub station. The discharge of each camera is consistent with our predictions and the system can function overnight with sunlight during the day to recharge. Multiple camera rigs have been deployed and function together on one Hub



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