E1.03 Fire-Bot Enhancements

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Enhancements

- ❖ AI ML Optimization- Optimize the machine learning models to run on Jetson Nano GPU instead of CPU
- ❖ Rich Information Display- Develop an interface to display results of machine learning decisions, LiDAR mapping, and live environmental data
- ❖ Automated Navigation Using Depth Camera- Use the depth camera to design autonomous navigation for the rover
- ❖ 2-D Room Mapping Using LiDAR- Implement LiDAR capabilities to the rover and use ROS 2 to transmit data

Project Overview

- ❖ Ongoing research project
- ❖ We will be adding features and enhancements to an existing rover
- ❖ Designed to autonomously enter burning buildings and find survivors within
- ❖ Made to reduce or eliminate firefighter injuries and deaths in the line of duty

Meet the Team

Oscar Resendiz (PM)   Timothy Maraj   Benjamin Swann   Tony Alebesun

Block Diagram

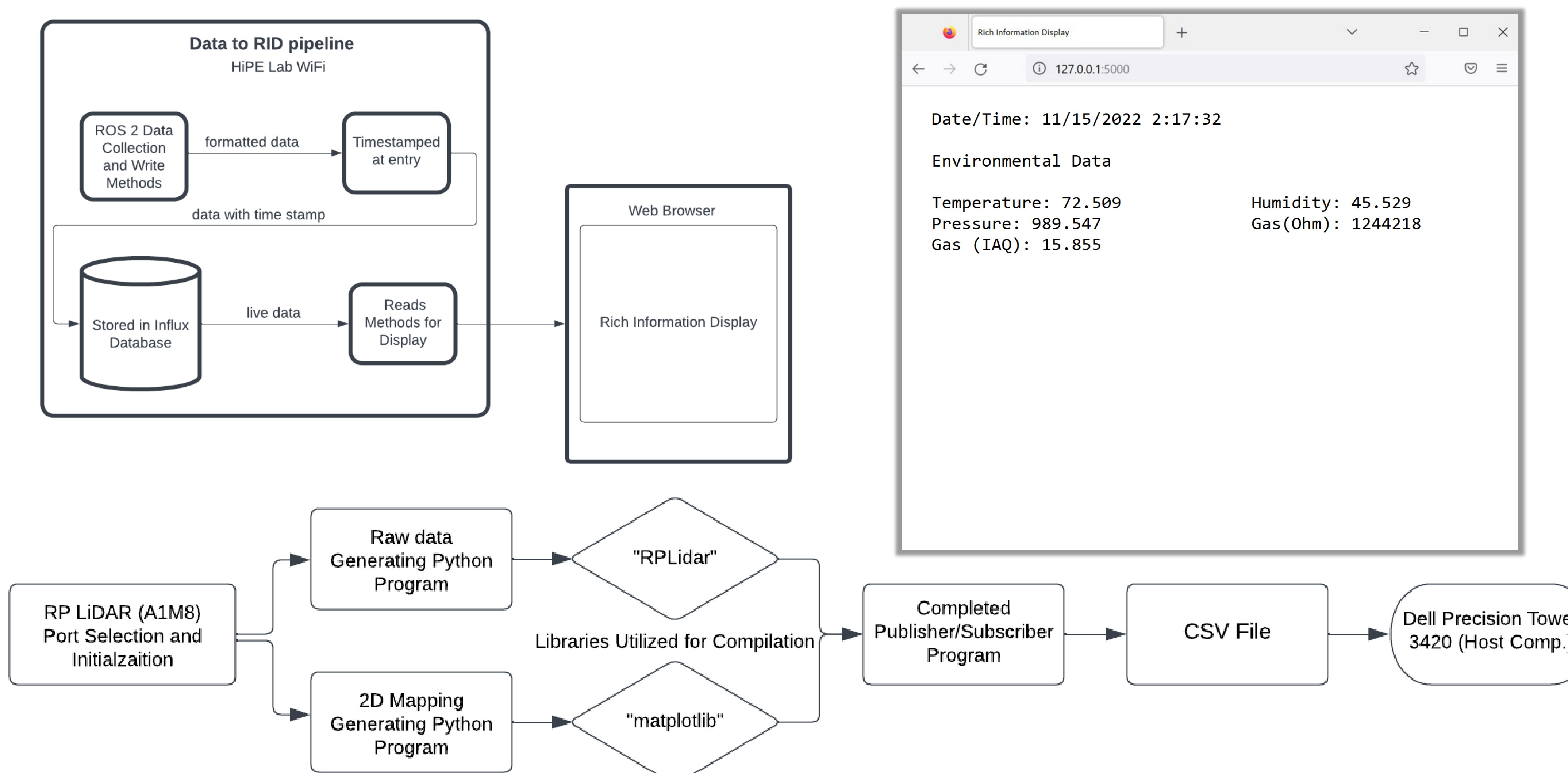## LiDAR Data Write and Rich Information Display Data Read
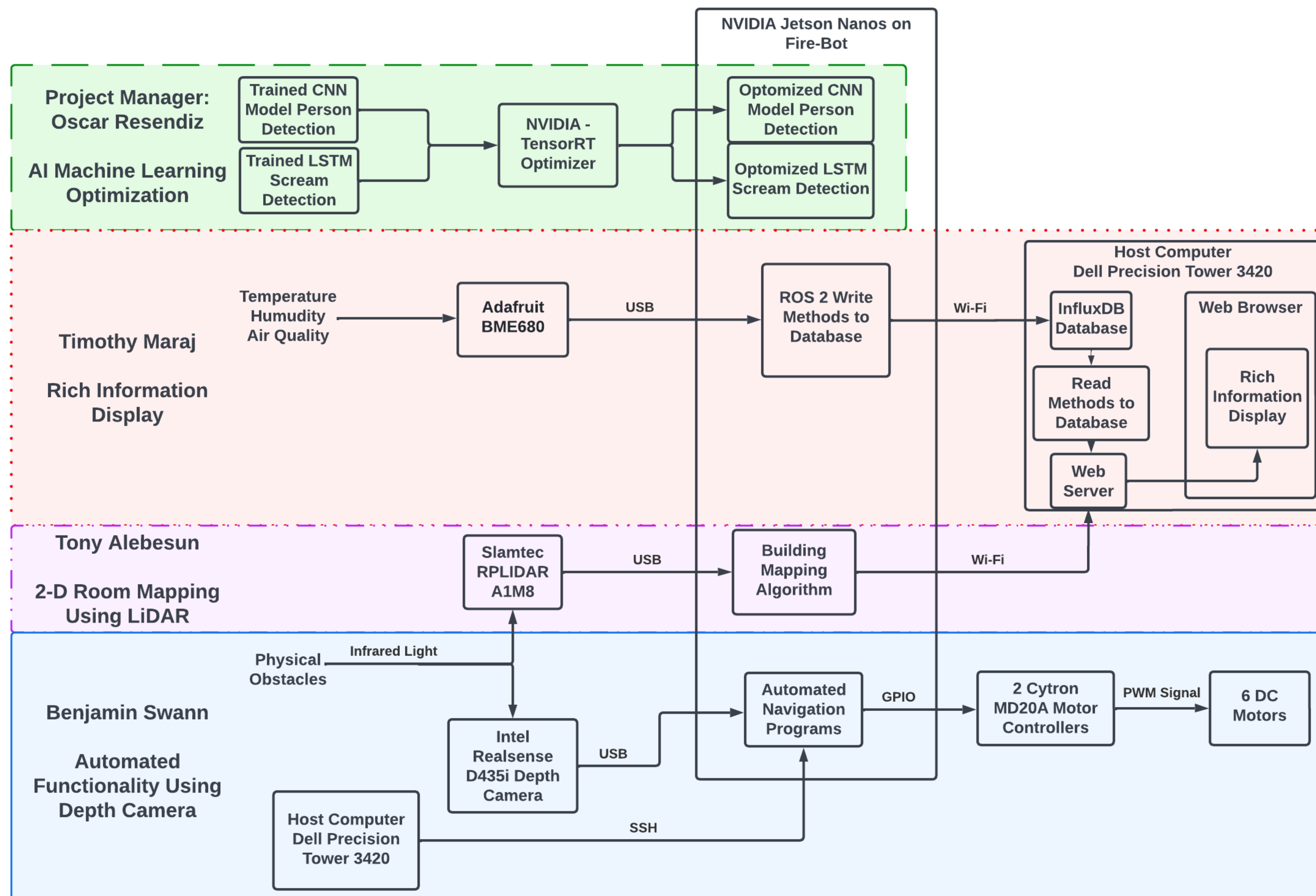
D1 Accomplishments

- ❖ Optimize machine learning models to run on Jetson Nano's GPU instead of CPU
- ❖ Display dynamic dummy data from a database to a Rich Information Display viewable on a web browser
- ❖ Store angle and distance data from LiDAR to a CSV file
- ❖ Develop a method to automatically send the CSV file into a database
- ❖ Transmit accelerometer, gyroscopic, and distance data from depth camera through multiple devices using ROS 2
- ❖ Learned basic ROS 2 publisher subscriber methods to use with the LiDAR, depth camera, and Rich Information Display

D2 Plans

- ❖ Develop automated navigation programs using Intel Realsense d435i depth camera
- ❖ Map entire building floors using LiDAR
- ❖ Display live environmental data as well as room-mapping data on the Rich Information Display
- ❖ Further optimize machine learning models

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