

Control Module/Interface for Service Robots

Senior Design Team 315

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Abstract

The purpose of this project is to design a control module/interface which enables a motorized system to follow a user and allow for seamless switching between manual and semi-autonomous mode.



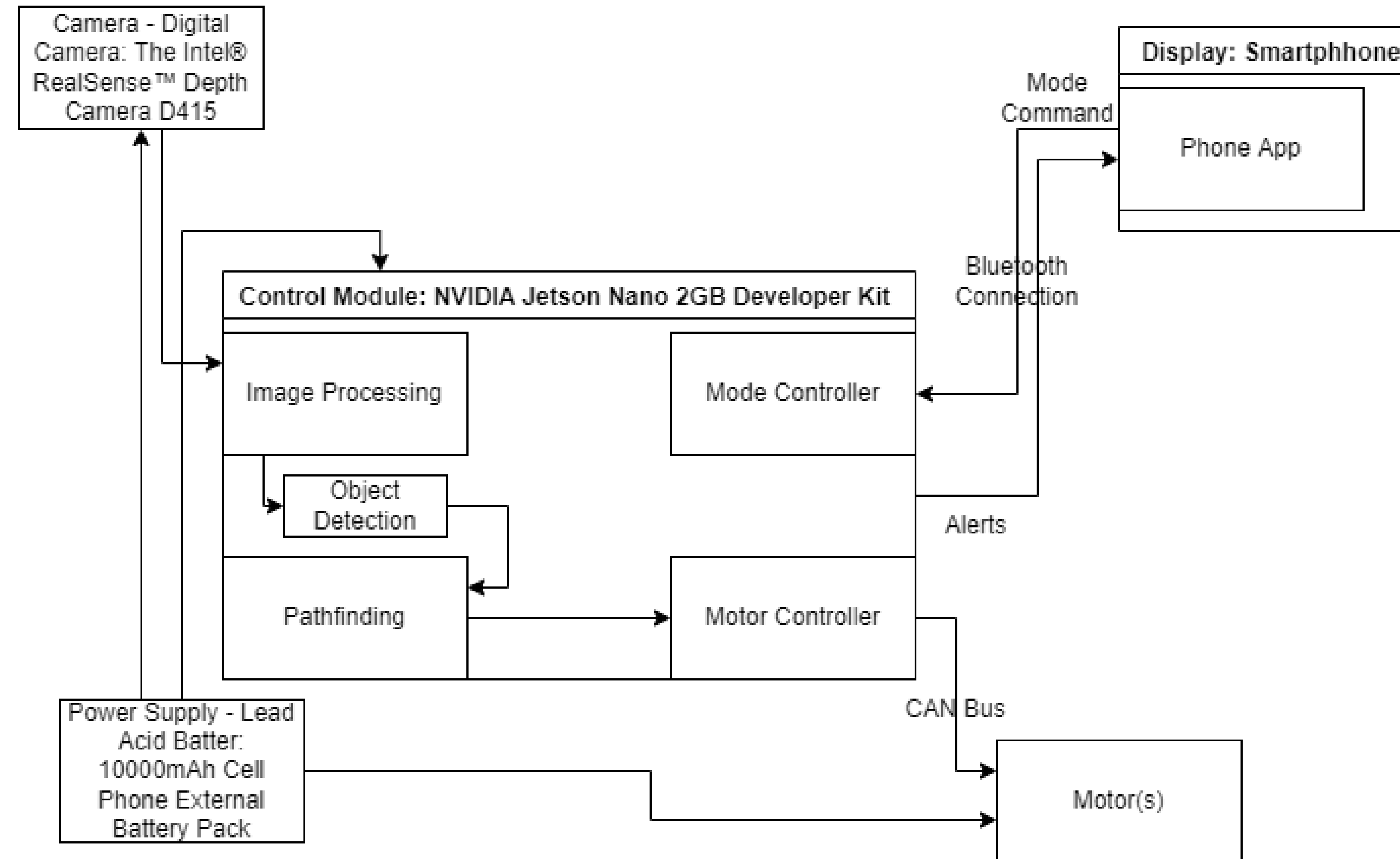
Project Scope

- Design control module
- Extension onto an existing motorized system
- Dynamic with other motorized systems
- Follow user
- Obstacle detection
- Utilize camera(s) for image processing
- Track user via phone app
- Obey safety procedures to
- Powered by battery

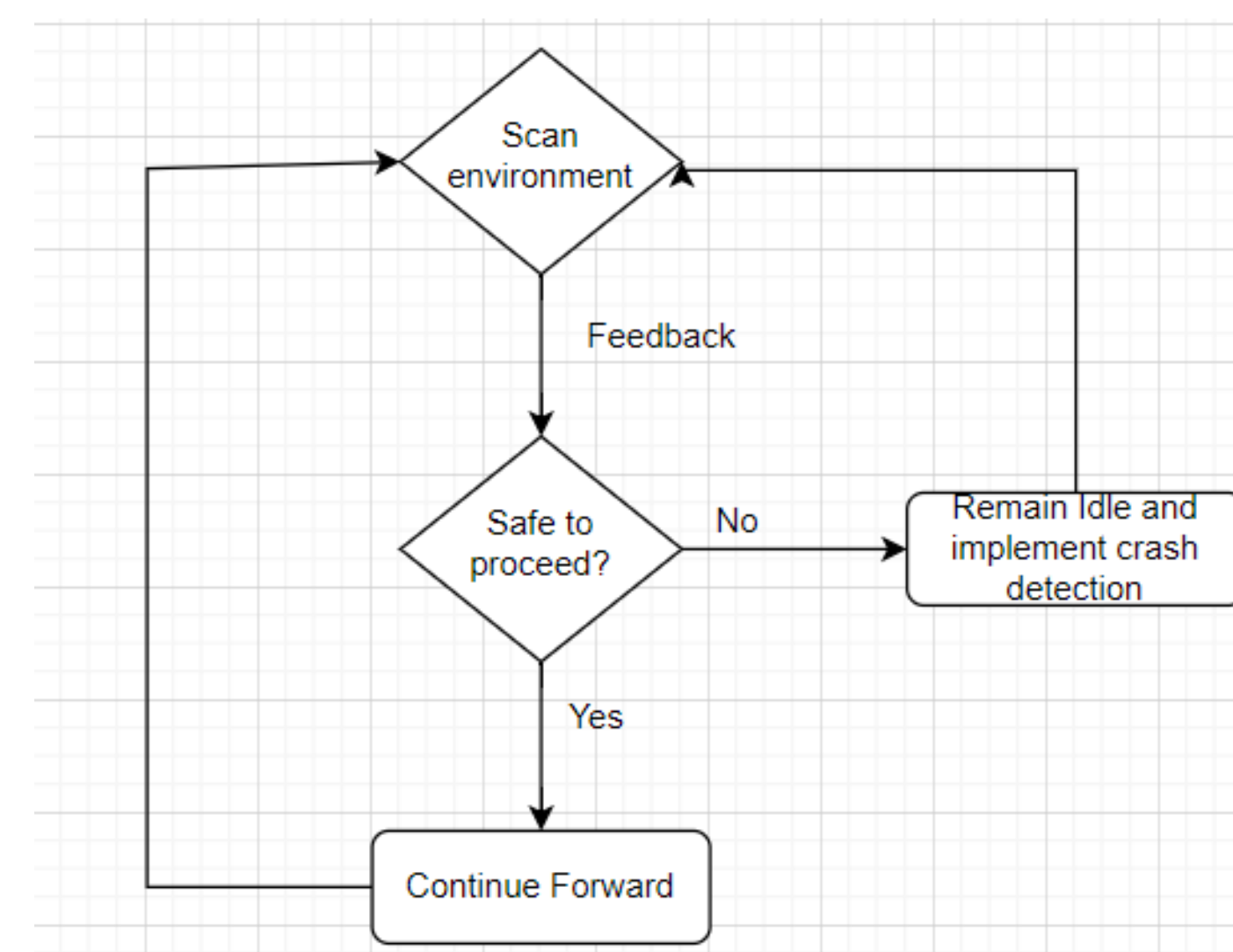
Selected Concepts

- User interface: Phone App
- Cameras/sensors: Digital Camera - Intel RealSense™ Depth Camera D415
- Display: User Smartphone
- Connectivity: Bluetooth Connection
- Power source: Lead Acid Battery – 10000mAh Cell Phone External Battery Pack

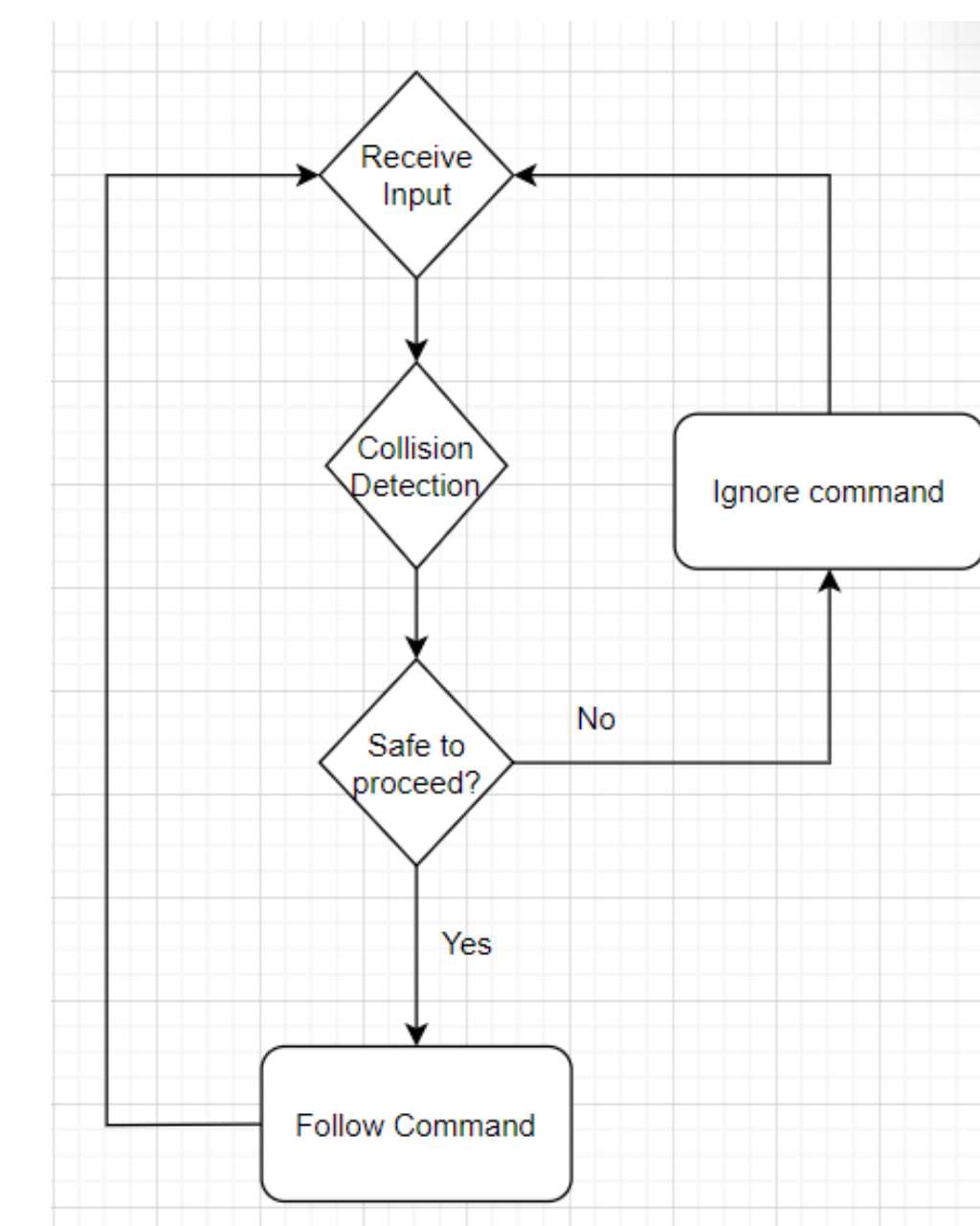
Preliminary Detailed Design



Service Robot Block Diagram



Semi-autonomous mode execution loop



Manual mode execution loop

Applications

- Grocery stores
- Hospitals
- Construction sites
- Warehouses
- Golf courses
- Restaurants



Summary/Future Works

A large emphasis will be placed on the control logic unit, more specifically how input read in from the cameras deciphers between the user and other objects to create a path to follow the user. Algorithms will need to be chosen for image processing, path finding, user detection, and object detection.

