2020 Field Testing Manual

Rover Setup, Connection, and ROS Configuration

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1. Introduction

This document is designed to be a self-contained directive on rover operation for future researchers and students at the Aerospace Robotics Laboratory (ARL). Some content is reiterated from the document *ConnectingControllingHuskyAndArgo* by J.S Fiset (see resources at `https://github.com/brahste/data_collection`). However, substantial changes to the field testing procedures have been implemented, warranting a new manual to explain the setup, both experimental and configurational.

2. Sensors & Hardware INCOMPLETE

Three primary sensors are equipped on the rover:

1. a ZED stereo-camera (ZED cam)

2. a VectorNav Inertial Measurement Unit (IMU)

3. FDTI current sensors for the front left and right wheels

To incorporate the ZED cam into the sensor suite a laptop with a CUDA capable GPU is required. For this purpose, a Lenovo P53 with a GTX 1080 Ti is used.

3. Network Setup

To command the rover from the Main Computer, ensure that it is connected through a hub. For our experiments a Cisco Wireless Access Point/Hub was used.

4. Software Configuration

The field testing experiments are implemented and governed by the ROS package `data_collection`. Code for the package is hosted at `https://github.com/brahste/data_collection`. Given that separate packages have been developed for each of the the three sensors outlined in Section 2, as well as the software to interface with the rover's themselves, the main access point to the hardware suite is through the launch file `data_collection_experiment.launch`. Specific experimental parameters can be set from files in the `param/` folder prior to launch. Upon `roslaunch`-ing, the master node is initialized, along with the following nodes:

```
you can use a box as such
```

5. Node Information

blah