Milestone 4 - List of Deliverables

Project :   Propbot Autonomous Robot

Authors :   Team 50,

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1. Propbot Software (source code)

Source code will be made publicly available on a GitHub Organization named "PropBot" (https://github.com/UBC-RSL-PropBot/PropBot). The main branch is called "master". A Radio Research Lab (RSL) representative (for example, Hamed) will be added as owner of the organization, with full administrative power.

The source code includes all files and packages required to operate Propbot in its current state, as well as all its validation tests. This includes:

- Autonomy Package code (/vehicle_autonomy), with ROS packages in a directory called "/vehicle_autonomy/package_name". Included ROS packages are:
  - Propbot_autonomy: responsible for launching autonomy with configurations set by user
  - Propbot_control: responsible for interfacing with Arduino board and current motor controllers
  - Propbot_description: contains urdf and stl description of Propbot
  - Propbot_drivers: contains configurations for drivers to interact with peripherals (Intel Realsense d435, Ublox C94-m8p GPS)
  - Propbot_mission: module responsible for creating missions
  - Propbot_navigation: responsible for path planning
  - Propbot_slam: main SLAM algorithm
  - Propbot_state_estimation: aggregates data to unify state
- Vehicle Interface system code (/vehicle_interface), which includes the directories
  - Project_teleoperation: contains source code, header files, and libraries that can be flashed on Arduino to run Propbot. Also contains a .pio project file that can be opened on PlatformIO.
- Mission Command Center code (/mission_command_centre), with ROS packages
  - Mapviz_plugins: plugins for mapviz visualizer
  - Propbot_mission_gui: launch files for MCC
- Nvidia Jetson NX setup scripts and associated configurations (/scripts)
- Autonomy Simulation source code (/simulation), contains ROS packages:

- Propbot_gazebo: configures simulator, physics engine and worlds
- Propbot_rviz: configures visualizer
- Propbot_simulation: launch files for simulation

All ROS packages follow ROS standard format. That is, source files are under "package_name/src/", configuration files are under "package_name/config/", header files under "package_name/include", launch files under "package_name/launch/", and each package has a CMakeLists.txt and package.xml for compilation.

2. Hardware & Components

A list of components that will be handed over to RSL:

- 1 x Flashed Nvidia Jetson NX
  - Includes 1x Power supply and adapter
  - SSD drive flashed with JetPack 32 kernel
  - SSD drive contains source code for autonomy system
  - Login credentials will be shared with Hamed upon delivery
- 1 x Unflashed Nvidia Jetson NX
  - Includes 1 x power supply and adapter
  - In new/unused state
  - Is marked by visible yellow tape on the shield (to differentiate it from the flashed Jetson NX)
- 1 x Intel RealSense D435 in original box
  - Includes USB-C wire
- 2 x U-blox C94-m8p GPS in original box
  - Includes 2 x receiver, 2 x serial cable, and 2 x UHF antenna
- 1 x Bno55
- 1 x Arduino Mega
  - Flashed with latest Vehicle Interface System code
- 2 x battery pack
- 1 x FlySky remote controller
- 3 x boxes of unused items, each includes:

- - A list of included items in the box
- 1 x E-Stop button
- Propbot Vehicle
  - - Includes intact wiring, motor controllers, power management system, 6 x mounted sonar sensors

A delivery date no later than April 28 will be agreed upon. Individual components will be put into boxes and delivered to Hamed's office in the Wesbrook building. Similarly, Propbot Vehicle will be taken out of the Life building and put into the RSL office in Wesbrook.

3. Documents & Media

- Updated user operation guide
  - - Can be found on GitHub master branch: /docs/capstone2022/user_operation.pdf
  - - Included in email sent to Dr.Michelson and Hamed
- Test document showing all completed tests
  - - Can be found on GitHub master branch: /docs/capstone2022/validation.pdf
  - - Included in email sent to Dr.Michelson and Hamed
- Hand over document addressed to future teams which outlines the current state of all hardware/software components and future improvements
  - - Can be found on GitHub master branch: /docs/capstone2022/handover.pdf
  - - Included in email sent to Dr.Michelson and Hamed
- A video showcasing teleoperation
  - - Full video will be shared with Hamed via Google docs
- The project budget document
  - - Included in email sent to Dr.Michelson and Hamed

Client Signature : _____

Date : _____