Weekly Report - Tuesday, March 26, 2019

Auburn University IEEE SoutheastCon 2019 Hardware Competition Team

Current Development Tasks

Task Name	Category	% Compl.	Progress Updates
ROS Localization	Software	70%	Localization is almost completely done. We are running into a few ROS errors, however, we are actively seeking answers.
Design and Build Control Panel	Electrical-Mechanical Integration	70%	First control panel completed and wired to protoboard - needs to be programmable by the Pi via Arduino serial
Fabricate, 3D Print, Assemble, and Wire New Robot	Electrical	30%	3D printing in progress, some assembly done
Motor Controller Integration	Electrical-Software Integration	100%	For extra precision in controlling the motors, encoders have been wired to Pi, are being programmed and only need to be mounted onto the competition robot.

Senior Design Team Members Time Management

Member Name	Task Name	~ Hours Spent (past week)
All Members	Team Meetings	2.5
Matthew	Integrate Visual Detection in ROS	6
Nia	LIDAR Localization and ROS	5
Joe	Integrate Encoders in ROS	7
Josh	Electrical Hardware Placement	6

Tasks to be Accomplished Before Competition

Task Name	Version*	Category	Deadline	Assignee
Construct 9"x9"x11" interior sizing box	2	Mechanical	April 1st	Alex
Fabricate, 3D Print, Assemble, and Wire New Robot	2	Mechanical/ Electrical	March 27th	Full Team
Main and Auxilary Battery Voltage Detection	2	Electrical/ Software	April 1st	Joe
Wire Encoders	2	Electrical	March 27th	Joe
Design and Build Control Panel	1 and 2	Electrical	March 27th	Josh
Integrate Serial Control in ROS	1	Software	March 27th	William
ROS Localization	1	Software	March 27th	Nia/Noah
Capture ROS bag	1	Software	March 27th	Nia/Noah
Integrate Encoders in ROS	1	Software	April 1st	Matthew/Joe
Test and Tune Full Competiton Algorithm (With 1 robot)	1	Software	April 5th	Full Team
Test and Tune Full Competiton Algorithm (With 2 robots on the field)	1 and 2	Software	April 12th	Full Team

* The currently built robot is version 1. The new/competition robot will be version 2. Tasks implemented in version 1 will be propagated to version 2.

Achievements, Obstacles, and Risks

Accomplished Tasks Since the Last Report

Task Name	Version*	Category	Assignee
Modify wheel design to accommodate rubber tread	2	Mechanical	Alex
Incorporate encoders	1	Mechanical	Alex

Modify frame and bumper to have > 1cm radius per rules	2	Mechanical	Alex
Add an interior lip to close the gap in bumper	2	Mechanical	Alex
Reduce the center of gravity	1	Mechanical	Alex
Design flag raising mechanism	2	Mechanical	Matthew
Mounting hole improvements on Electronics plate	2	Mechanical	Josh
Inventory and Order Parts for new Robot	2	Mechanical/ Electrical	Alex/ Josh
Aesthetical Improvements and Enclosing Electronics	2	Mechanical	Matthew
Design and build Protoboard	1	Electrical	Josh
Integrate Visual Detection in ROS	1	Software	Matthew

We are making a lot of progress on the new robot. The design is complete with the exception of some slight control panel modifications. The 3D printed parts are being printed. The 8020 aluminum has been cut. All the parts except the motor controller has arrived. We can borrow the one from the old bot until it comes in. We will be working on creating a second control panel and protoboard as parts continue to be printed. The picture below shows the status of the assembly of the new bot.
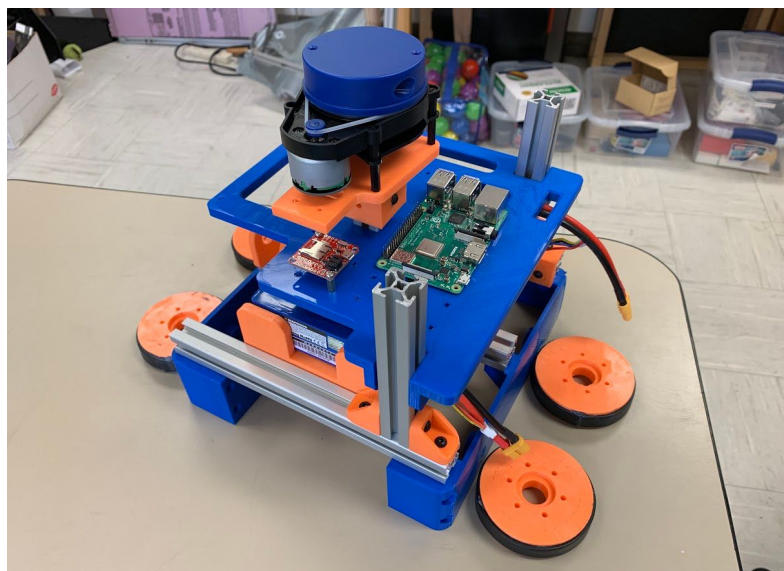
From a hardware perspective, the first robot has been completed- all components that will be on that version have been mounted and powered. It is missing some software components to allow the main control loop to use the hardware, however. The control panel LCD control wiring was added to the protoboard, and the "Go" button was replaced as it will be used for the final robot instead.

The vision node in ROS has been completed and tested. We had to overcome some compiling obstacles but it is now operating like expected. The data is passing through and is ready to be integrated with the localization node when it is completed.

A static map of the competition has been generated and is currently publishing to a node. A LIDAR, laser transform node, and transform node were created within ROS to use the navigation stack that was compiled in previous weeks. The next step is to get the laser scan data to transform onto the static map after which the localization algorithms can be applied.