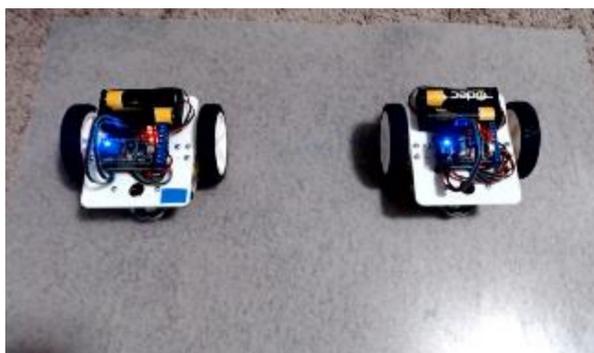
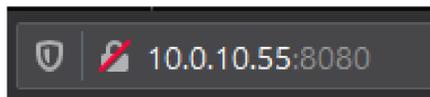


Introduction

The purpose of this project is to develop a graphical user interface (GUI) for controlling multiple mobile robots. The aim of this development is to provide a simple and easy way to interact with, and command multiple robots through user-friendly interface rather than complex programs. By providing a way to interact with robots via buttons and inputs, the project will engage students at Eastern Illinois University to begin their journey to digging deeper into the world of programming and robotics.

Methods

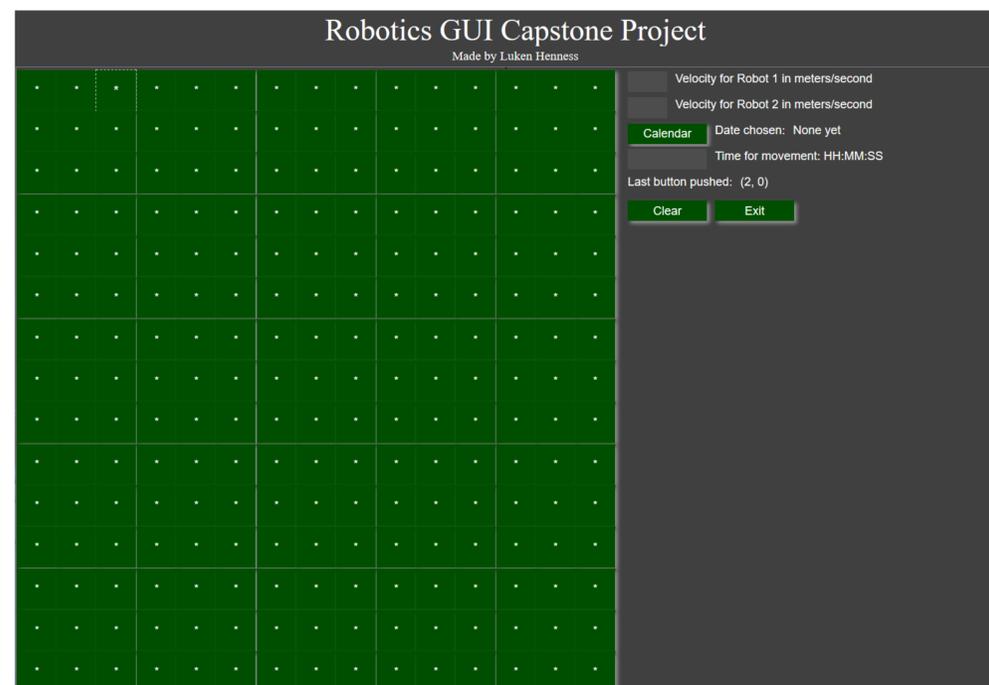
The program stack used in this project starts with the GUI. The GUI is developed using Python language with the library of PySimpleGUIWeb. This library allows programmers a simple way to build and host web applications accessible by typing an URL into a web browser pointing to a resource on a remote machine (i.e., remote.IP:port)



Graphical User Interface

Below is an early build of the GUI. This build has since been revised and improved to allow easier interaction. A user can create a path for the robot by interacting with the GUI.

First, the user choose a starting location and end location for the robot on the 5 x 5 grid layout. Next, the user inputs velocity (speed) for each robot and time to start moving the robot. Then, the program will generate a database script that is used to input new robot controlling command to a locally hosted instance of MySQL database. Every 100 milliseconds the program running on the robots will query the database for commands to run individual robots. These commands will then put the robots on actions they should take. If there is no command to run, the robots will stay in idle mode.



Results

The result of the project will be a simple and effective way to run a single command (start_stack.sh) to interact with and learn more about robotic interaction than possible with a longer introduction. The full stack (Python code, MySQL database, Apache, Arduino code) will be fully dissectible and documented for students to explore and fork for their own on GitHub:

<https://github.com/lrhenness/roboticsGUI>

Conclusions

This project is intended to be used as a tool to educate students interested in robotics. The user interface is made in such a way to provide multiple modes of operation allowing students to experiment and interact with robots in many ways. Through a project as simple as creating a frontend for commanding robots I hope to inspire future students to explore the world of creating functional and practical code.

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