RapidEMS Progress Report 2

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This report outlines progress on RapidEMS, our system improving of emergency vehicle response in cities. We use RapidGLD, a version of Greenlight District Simulator, for simulations. Steps include updating GLD, creating an EMS vehicle model, and simulating road systems. We have been working on prepearing skeleton software for use in the raspberry pi's. We use PuTTy as a terminal emulator to SSH into our pi's and remotely install software and configure our GPS and Python software to communicate with each other and simulate a civilian and an ambulance.

I. TRAFFIC PATTERNS

This progress report outlines the developments and preparations made for our project, focusing on simulations and materials for the implementation of RapidEMS—a system designed to improve emergency vehicle response efficiency in urban areas. The simulation aspect involves the use of Greenlight District Simulator (GLD), specifically our adapted version named RapidGLD. This microscopic-model vehicle and traffic simulation facilitates data collection and analysis, allowing us to simulate real-world traffic scenarios and extract valuable information about the response times of EMS vehicles.

II. TESTING

Testing of Data will occur utilizing our version of the Greenlight District Simulator (GLD), RapidGLD. A new Roaduser, Ambulance, was created to effectively simulate an emergency medical or emergency response vehicle. Vehicles will be programmed according to RapidEMS's process, which is to alert vehicles via alert before the sound of the Ambulance's sirens can be detected by the human ear. Each vehicle will switch lanes and to create a free lane for the ambulance. Using this process, we aim to decrease the average waiting time of Ambulances as they travel to a hospital.

A. Locations

The locations that were carefully picked have now been incorporated into our project by coding their coordinates in java with their respective hospitals and being added into the simulator. The reason we have decided to incorporate Java in our project because the goal is to be able to make a simulation that can accurately mimic a real life scenario. This simulation will be able to track data similar to real life so that the data and results collected by the simulation can be reflected on to an actual scenario.

III. MATERIALS

Our physical materials are currently still in transit. There is not much we can do with physically testing these items.

As a reminder, these are the materials we ordered.

- Raspberry Pi 4 (4GB Ram)
  - $62.90
  - QTY: 2
  - These tiny computers run off USB power and are perfect to run python scripts. With built-in wireless connectivity, they can communicate with other PI's over Bluetooth, radio, or Wi-fi. One will represent a civilian, the other will represent an emergency vehicle.
- Raspberry Pi GPS Modules
  - $18.98
  - QTY: 2
  - These GPS modules allow full coordinate tracking and offline geo-location on the pi. For our case, we will use this to determine if the emergency vehicle is approaching by reading the longitude and latitude values.
- SanDisk Dual 64GB MicroSD Card
  - $14.35
  - QTY: 1
  - This is simply the storage devices that Raspberry Pi's use to hold their operating system and applications.

IV. FUTURE PLANS

Once our items arrive, we will do software testing and make sure all the radios and GPS modules are properly calibrated and ready for use. We then will preform mock tests to ensure that the system communicates correctly and with as little delay as possible.

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