Smart Emergency Traffic Light System

Introduction

EMS (Emergency Medical Services) faces a traffic congestion problem to reach for patients. So we created a Smart Emergency Traffic Transformation System to minimize the response time to reach the patient. Unlike the traditional way of EMS, we are using motion sensor to activate the traffic signal with adding more features to improve the navigation efficiency.

Objective

- Minimize EMS response times by addressing traffic congestion
- Prioritize public safety and improve patient outcomes.
- Optimize emergency response processes to save lives.

Problem Statement

Emergency Medical Services (EMS) encounter significant challenges in promptly reaching patients due to traffic congestion, which can result in critical delays that impact patient outcomes.

Constraints

- **Sensor Range Overlap**
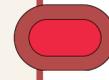- **GPS Accuracy Limitation**
- **Limited Traffic Lights**

Specification

- **3 seconds for the traffic light change**
- **98% successful communication rate**
- **Data exchange in less than 100ms**
- **4 meters square city**
- **Car size is 15x7x10**
- **Motion sensor maximum range is 700cm**

Testing/Validation

Functionality: conducted to evaluate how well the prototype manages traffic flow, detects ambulance motion, and activates traffic lights appropriately. This included simulating different traffic situations and emergencies to gauge the prototype's responsiveness and precision.
User Experience: Testing focused on evaluating the usability and effectiveness of the prototype's interface

Prototype Design
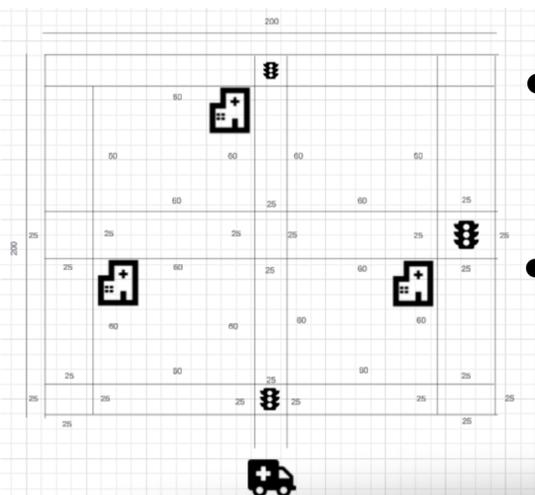
- A city that utilizes sensors and Arduino
- Mobile Flutter app that communicates and sets off the system
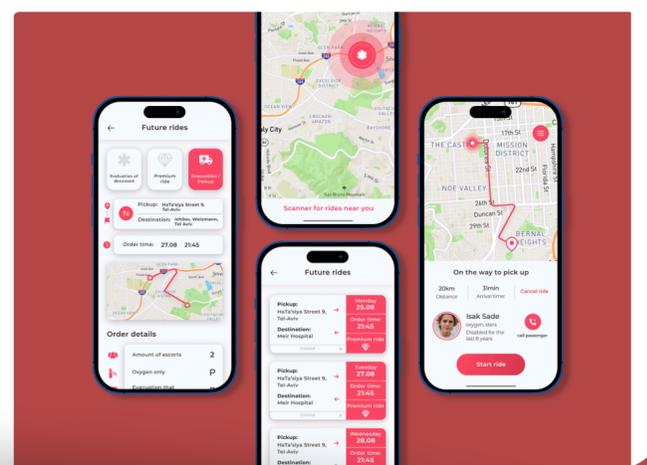
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