CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

Daniel Alivov; Diana Alivov

Project Number

J1001

Project Title

Bluetooth Controlled, GPS Guided Robotic Car

Abstract

Objectives

The purpose of our project was to create a driver-free car that is GPS navigated, road following, and avoids obstacles when equipped with an Arduino Uno microcontroller. In addition, our car reacts to traffic lights similar to real street traffic lights: it stops on red, slows down on orange, and goes on green.

Methods

We used a microcontroller called Arduino, which interfaced with other electronic devices we used such as a GPS (Global Positioning System) module, line following sensors, ultrasonic sensor, color sensor, DC motors, and a Bluetooth module. We were programming the microcontroller in Arduino IDE to detect signal from sensors and to control car motion using Bluetooth communication and GPS. Bluetooth communication was achieved using a smartphone. There were 4 DC motors moving the car, which were paired with a motor shield.

Results

The robotic car was successful. Our car is GPS guided, follows a road, avoids obstacles, reacts to traffic lights, and communicates with Bluetooth. A problem we faced was unstable connections in the circuit with the DC motors, but that was fixed by using an Adafruit motor shield.

Conclusions

This project demonstrated a self-driving car using an Arduino Uno microcontroller that is navigated by GPS, follows a road, avoid obstacles, reacts to traffic lights, and controlled by Bluetooth. In today s world, driver-free cars are becoming a reality. This saves much man force and time, and would reduce the number of car accidents that happen in our world. The idea of self-driving cars could impact our future tremendously.

Summary Statement

Our project is a robotic car that is controlled by Bluetooth, is GPS navigated, follows a road, avoids collisions, and obeys traffic lights.

Help Received

Help was received from our father who taught us the basics of electronic devices, the building of electrical circuits, and programming. However, everything in this project was done by ourselves.