

SE101 Lab Project Proposal: Autonomous Toy Car

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Project Overview

Our project will be to modify a store bought RC car and turn it into an autonomous phone controlled car with multiple functions. There will be two main modes for the car: user control mode and automated mode. User control mode will be used to test the vehicle and override the automated mode on the car in case of malfunction. Automated mode will be the default and the final objective of our project. If all the goals are achieved, the car should be able to avoid objects, navigate using GPS, stay within a track, recognize red, yellow, and green lights and act accordingly, and have turn signaling.

Software

The software used to control the car will be an Android app, which will communicate with the car over Bluetooth. It is also planned that the software will collect data from its sensors and a mini camera mounted on the car. A neural network for automation can also be implemented so that the car can act upon the data that it has collected.

Hardware

The hardware to be used in this project includes an Elegoo Uno R3, a stripped-down store bought RC car, an ultrasonic/laser distance sensor, infrared sensors, a mini camera, a bluetooth module, LED lights, and miscellaneous wires and resistors.

Anticipated Challenges

The most immediate challenge for this project is the uncertainty of the compatibility of the store-bought car's internals with our Arduino. We may have to implement more of our own hardware in order for the car to function and communicate with the Arduino properly. Another challenge for this project is simply the ability to finish all of our goals on time. We recognize that some of these goals are ambitious, but hope to accomplish and learn as much as we can.

Prototype Plan

The prototype is planned to be evolutionary. It will be produced in the order listed under the "Project Overview" section. In other words, manual control will be implemented and refined first before the functionality for automated mode is started.