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EE445L Lab 7/11
Requirements document

As always, feel free to adjust the syntax and format of your requirements document as you think appropriate. The goal of the document is to provide a clear an unambiguous description of what the project does.

1. Overview

1.1. Objectives: Why are we doing this project? What is the purpose?

The project is to bring together what we've learned over our past courses and introduce us to designing a full product. We will be making a car that uses omni-directional wheels rather than traditional wheels and communicates with a separate microcontroller using radio frequency modules/UART.

1.2. Roles and Responsibilities: Who will do what? Who are the clients?

Zach's main concern will be motor control, but he will be heading the hardware design. Ali's main concern will be the RF modules/UART and controller, but he will be heading the software design.

1.3. Interactions with Existing Systems: How will it fit in?

We will be using RF modules/UART to send data from the controller Launchpad to the vehicle Launchpad for speed and directional controls.

2. Function Description

2.1. Functionality: What will the system do precisely?

The system is split into two parts: The car and the controller. The controller will let the user control the speed and direction of the vehicle with joysticks. It will send data via the RF module/UART on the TM4C123. The TM4C123 will then take that data, display it on an LCD, and update the motors' speeds to match the data.

2.2. Performance: Define the measures and describe how they will be determined.

Connection reliability: How far can the controller and receiver be separated before transmissions break down to an unusable state?
Control responsiveness: How quickly does the car react to a controller command?
Motor accuracy: Do the wheels turn at the same speed? Does the car go exactly the direction the user directs?

2.3. Usability: Describe the interfaces. Be quantitative if possible.

The main interface the user will interact with will be the controller, which will be a joystick wired to a Launchpad. The car will have on/off and reset switches.

3. Deliverables

3.1. Reports: How will the system be described?

There will be reports at the end of lab 7 and lab 11.

3.2. Outcomes: What are the deliverables? How do we know when it is done?

A) Objectives
B) Hardware Design
C) Software Design
D) Measurement Data
E) Analysis and Discussion