

Project
Due Mon. 12/05

Arduino Microcontroller Project

1 Description

The microcontroller project is designed to teach and test knowledge learned in EE292 with the creation of “intelligent” circuits. A microcontroller is a small processor with physical inputs designed for integration with real parts. The goal of the project is to utilize discrete circuit components and the inputs to the microcontroller to compute and produce a useful output. This project should be a fun experience will give you experience that will be beneficial for Senior Design.

The microcontroller that will be used in this class is the

- Arduino - <http://arduino.cc/en/>

which is small, but powerful. The Arduino will be paired with physical devices such as the elements of the class lab kit to develop intelligent circuits.

The project should be completed in small groups of two or three. Each group will submit a project proposal before beginning programming and a report and final presentation at the completion of the project.

2 Proposal

After looking at the Arduino website, an initial project proposal must be submitted on Tuesday 11/20. The proposal is a very short document (half a page) which describes the high-level functionality of the project. It should specify what the project will do and the parts that will be utilized.

The short proposal document should include:

1. The names of all your group members
2. A picture of the group holding your working Mendenhall Mechatronics Kit
3. The description of your final project.

3 Report

At the completion of the project a report must be generated to describe the project. The project report should be approximately 4 pages and contain the following sections:

1. Abstract - This brief summary of the project purpose presents a general overview of the project topic and solution.
2. Description - The project description provides and introduction to the project topic and expands upon the abstract. This section completely explains the specifications of the project: e.g. the objectives, functionality, and components used.

3. Implementation - The project implementation provides the details on how the specified problem was solved. This implementation will include the physical hardware utilized, your programming methodology, the special microcontroller features that were utilized, efforts to optimize the project code, and any difficulties encountered while implementing the design.
4. Experimental evaluation - The experimental section describes how the project program performance was evaluated. This section should provide examples that highlight what input devices and sequence of actions were used to affect a result and how those results can be observed and confirmed. There should be sample input signals and corresponding output on an output device.
5. Summary - The conclusion of the report should provide a summary of the project aim and results as well as highlight both what was learned working on the project and what further directions would improve the project.

4 Presentation

Each group will be given 5 minutes to present their projects on Thursday 12/06 in class. The presentation should be approximately 4 minutes (approximately 1 slide/min) to leave a few minutes for questions and discussion. The presentation should highlight the problem, solution, and demonstrate your project in action either as a table-top demo or as a video (preferred). Each group member should be present and contribute to the presentation. Please email your presentation files prior to class so they may be preloaded. Be sure to bring a backup copy either on a disk or flash drive (this can be your electronic submission).

5 Deadlines and Deliverables

The following highlight the important dates and items to be submitted for the project. The project will be worth 15% of your final grade.

5.1 Deadlines

1. 11/20 Project proposal
2. 12/06 Project presentation
3. 12/06 Project report

5.2 Deliverables

1. Hard copy version of report (4 pages)
2. Electronic submission including report, code, presentation, and demo video.

References

1. <http://arduino.cc/en/Tutorial/HomePage>
2. <http://www.ladyada.net/learn/arduino/>
3. <http://tronixstuff.wordpress.com/tutorials/>