MCHE 470: Robotics

Fall 2013 – Mini-Project 2

Assigned: Thursday, September 19th
Part 1 Due: Friday, September 27th, 5pm
Part 2 Due: Friday, October 4th, 5pm

Grading: Part 1 is P/F.
Part 2 is worth 5 points.

Assignment: Propose a design for the Open Class competition at ARLISS. More information about the competition can be found in the attached documents.

Part 1: Your team should:

Understand the problem using a House of Quality
Define initial design specifications via Specification Sheet
Determine system functions via a Function Tree
Develop solution principles for sub-functions using a Morph Chart

Submit a single document containing computer generated (*not scanned hand-drawn)* versions of each of the design tools above.

Part 2: Submit a proposed *conceptual* design and the support for its selection via a document containing *at most* 5 pages of text (figures, tables, etc. are excluded from this page count). This support should include refined versions of the design tools submitted in Part 1. In addition, two alternative designs (for a total of three) and evaluation of them via an Evaluation Matrix should be included. A suggested outline for the report is attached to this document.

Submission: Hard copy to me or slid under my office door (Rougeou 225)

OR

Emailed pdf:

- to joshua.vaughan@louisiana.edu
- with email subject line and filename
  - `TeamNumber-MCHE470-Proj2p1` for Part 1
  - `TeamNumber-MCHE470-Proj2p2` for Part 2

Additional ARLISS Information

Competition Location:	Black Rock Desert, NV
General Competition Date:	Early-to-Mid September

Competition Goal: Autonomously navigate to a predetermined target location after being launched to approximately 12,000ft.

Open Class Specifications:

Must fit into a 5.75" diameter, 9.575" deep cylinder
Must be less than 1050g
Must not contain any potentially explosive components
Must operate autonomously

In order to win the competition, a device must:

Meet the specifications above
Autonomously navigate and stop within 100m of the a target location
Provide proof that the device was under control

Links to Additional Information:

- ARLISS Homepage – http://www.arliss.org
- Current and Past Georgia Tech Teams
  - http://singhose.marc.gatech.edu/RescueBot/
  - http://singhose.marc.gatech.edu/cansat/
- A paper discussing the project – http://cl.ly/1P2j1v3v3N3l
- Videos
  - http://youtu.be/zKTUsB7F0PY
  - http://youtu.be/AxJ9xw85ync
  - http://youtu.be/DT9EWJVINz4
  - http://youtu.be/0sqJvJoJUD0

Suggested Report Outline

Title Page

Abstract – Standalone summary of the report's contents

I. Introduction – Introduce the problem and its challenges.

II. Selected Design Overview
- Give a detailed description of the final design
- Include computer-generated figures that show its components and how it operates
- Start with discussion of the entire design before focusing on sub-systems

III. Problem Understanding
- A concise presentation of the problem understanding process followed
- As support, include and discuss:
  - House of Quality
  - Specification List
  - Function Tree

IV. Concept Evaluation
- Present two alternative designs
- Support the selection of your final design via Evaluation Matrices

V. Conclusions – A summary of what was presented in the report

VI. References (if needed)

Required Formatting

- Fonts
  - Times New Roman at a font size of 11 points; or
  - Computer Modern family of fonts at a font size of 11 points or larger.

- Margins - 1 inch in all directions

- A cover page that contains:
  - Project title
  - Course information
  - Team member names and CLIDS

- The abstract on a separate page

- Pages numbered beginning with the page of the Introduction

- All equations, figures, plots, etc. are computer generated

- IEEE-style citations

NOTE: A LaTeX report template is available on the class website and at:
https://www.writelatex.com/docs?template=MCHE-Report-Template