UNIVERSITY OF BRITISH COLUMBIA
MECH 423 – Mechatronic Product Design (Spring 2016)
Final Project – Handout #2/2
Project Demo, Video, and Report Specifications

Evaluation

Reiterating the previous handout, students are encouraged to be creative in their project proposal and project work. At the same time, students need to produce a working prototype that is robust enough to be demo'ed multiple times. Grading for your final project will include the components shown below with due dates.

Project component	Grade	Due date
Project proposal	10%	March 7
Project demo • Completion of each FR • Overall grade based on functionality, difficulty, creativity, and sensibility	60%	April 6 5-8 pm in KAIS 2020
Video (content, quality, and length)	15%	April 6
Final report	15%	April 11

Project Demo

All student teams must present and demo their project on **April 6, 2014 5-8 pm in KAIS 2020/2030**. Each team will be given 4 minutes to present and demo their project, followed by 2 minutes of questions and discussion. Teams are encouraged to show a Powerpoint presentation and their video. The project demo will be graded by the instructor, TAs, former students in MECH 423, and industry invitees.

Deliverables

The lab kits including gumsticks should be returned to the TA on April 11th. Portable hard drives will be provided to hand-in materials electronically. The final deliverables for the course are listed below:

- Lab 1-3 files (including code and report, for accreditation purposes only)
- Project proposal
- Project report
- Project demonstration video (must be <100 Mb)

Video

Your video should demonstrate key features of your working prototype. Your video should be short and to the point. The total length should be no more than 60 seconds and the total file size should be <100 Mb. Your video should be either narrated or contain annotations that explain the hardware to the viewer. Most of the video editing functions you'll need can be found on free programs like Windows Movie Maker or iMovie.

We may use your video to promote future offerings of MECH 423, as well as the UBC Mechanical Engineering. Please let us know if you prefer not to have your video made publically available.

Project Report

The project report follows the structure of the proposal with some modifications. Write the project report based on the following outline. Detailed descriptions of each section are presented subsequently.

0. Title page and abstract

1. Objectives
2. Rationale
3. Summary of Functional Requirements
4. Functional Requirement #1
   4.1. Approach and Design
   4.2. Inputs and Outputs
   4.3. Parameters
   4.4. Testing and Results
5. Functional Requirement #2
   …
6. Functional Requirement #3
7. Functional Requirement #4
8. Functional Requirement #5
9. System Evaluation
10. Reflections

Detailed Description of Report

0. Title page and Abstract (Graphical and Text)

The title page should include the title of the project, names of group members, permanent email addresses, a representative picture of the project, and an abstract of the project (~300 words). The abstract should summarize the objectives of the project and key features of the hardware developed.

1. Objectives

What was the overall goal and vision of your project? What did you plan to design and build? What did you accomplish? What didn't you accomplish?

2. Rationale

What is conceptually interesting about your project? Why is it worth your time to do it? How is it different from similar work at UBC and elsewhere?

3. Summary of Functional Requirements

Briefly describe each FR and the hardware and/or software that was developed to address each FR. Describe how signals are transferred and manipulated within your system. Use graphical illustrations if appropriate. Create a table containing all your FRs. Assign a percent effort value for each. Identify which team member will be responsible for a specific FR. For two person teams, only one FR can be shared between team members. The total of these values should add up to 100%. These values will be used as a guide for grading your final project, but will not necessarily be followed exactly. An example is shown below:

Functional Requirements	% Effort	Responsible Person
FR#1: Sensor interface circuit	20	Calvin
FR#2: MSP430 code to measure angular speed from motor encoder	20	Calvin
FR#3: MSP430 code to control LCD screen	25	Hobbes
FR#4: Motor interface	15	Hobbes
FR#5: VB user interface	20	Calvin and Hobbes

4. Functional Requirement #1

For each functional requirement in your system create subsections that address the following.

4.1 Approach and Design

Describe the objective of the FR. Describe the hardware and/or software that were developed to address the FR. Present design material such as circuit diagrams, algorithms and pseudo-code, mechanical drawings, solid models, block diagrams, screen-shots from user-interface software, and photographs of completed hardware.

4.2 Inputs and Outputs

Describe the inputs and outputs of the hardware and/or software module developed to address the FR. Examples include voltages representing physical parameters, serial data streams, and user-interface outputs. Present details such as the transfer function and range for analog signals, the format of serial message packets, and text and graphics presented to the user.

4.3 Parameters

Identify the parameters of the hardware and/or software module developed for this FR. (*i.e.* what are the knobs that need to be adjusted on this module?) Examples include sensor bias voltage, values of key circuit components, motor operating speed, dimensions of mechanical elements. Describe how these parameters affect the operation of the module. Discuss how you optimized these parameters.

4.4 Testing and Results

Describe tests that were performed to verify hardware and/or software functionality. Present test results such as observations, data plots, and photographs.

5-8. Functional Requirement #2-5

9. System Evaluation

Describe tests that were performed to verify the functionality of your complete system. Present test results such as observations, data plots, and photographs.

10. Reflections

What worked and what didn't work? Why? What would you do differently if you could do it again? What did you learn from this project? Identify 3 things you learned in MECH 423 that you consider the most useful. Identify 3 things you would like to learn going forward.

Report Evaluation

The final report will be evaluated based on the clarity of your writing and the completeness of your documentation. The completeness of your documentation will primarily be evaluated based on the contents of sections 4.1 and 4.4 for each of your functional requirements, as well as section 9. The following grading scheme will be used to evaluate your report.

Title page and abstract	30%
Functional requirements and system evaluation	60%
Reflections	10%