UNIVERSITY OF LIVERPOOL

DEPARTMENT OF ELECTRICAL ENGINEERING AND ELECTRONICS

Project Specification Form 2016-2017
Final Year BEng (*ELEC340*) and Year 3 MEng (*ELEC440*)

Student Name: Junming Zhang Module: ELEC340

Supervisor: Mark Bowden Student ID No: 201138928

Project Title: Development of a C^{++} based user-interface for a plasma simulation tool

Project Specification

A. Project Description and Methodology:

(Overall view of the project with proposed route to realization i.e. what are the project aims and objectives and how you are going to do it?)

This project develops a practical C^{++} based user-interface to help researchers and industry users obtain the output of plasma simulation effectively.

The existing simulation tool of plasma will generate large amounts of output data in various formats. Thus, the main objectives of this project contain research of plasma to select numerous output data and deep learning of C^{++}developing tool to build the user-interface. Specifically, it requires leaning of C^{++} based tools which contain Visual Studio (C^{++} fundamental), Qt (develop GUI) and OpenGL (build 3D graphics).

In order to achieve them within 20 weeks, background reading and research for plasma discharges should be the first objective, at the meanwhile, the skill of C^{++} developing tools should be practiced. Next, the developing of this software should be proceeded. Finally, the report and presentation of this project should be prepared.

B. Project Tasks and Milestones: (indicate the tasks and milestones that should be achieved and their expected dates e.g. understanding of theory, designs of circuits, construction of circuits, software specifications, working demonstrations etc.)

Tasks: (a task is a package of work that should be completed during a particular time period)

Preparatory Work Week 1 ~ Week 2
- Obtaining plasma simulation tool and relevant reading materials.

Research Work Week 3 ~ Week 15
-Weekly background reading for plasma discharges.
- Investigating and selecting significant data in numerous output files from plasma simulation tool.
- Investigating and comparing different interface of learning, researching and factory software.

Developing work Week 4 ~ Week 15
- Learning of corresponding C^{++} based software include openGL, visual studio and Qt.

- 3D graphical model display function developing.
- Write relevant report.

- Rapid loading text function developing.
- Write relevant report.

- Intuitive user-interface developing and combine all functions together.
- Write relevant report

-Software testing and optimization.

Report working Week 1 ~ Week 20
- Project specification report form writing.
- Preliminary report writing.
- Preparation for first presentation
- Creating poster.
- Preparation for bench inspection.
- Final report writing.
- Weekly virtual log book

Milestones: (an objective that should be achieved by a particular date e.g. the completion of a task)

Semester 1

Week 3
Completion of preparatory work, project specification and preliminary report writing.

Week 11
Completion of first presentation preparation.
Completion of rapid loading text function and 3D graphical model display function developing as necessary elements of user-interface.

Semester 2

Week 15
Completion of user-interface developing and whole system testing.
Completion of virtual log book.

Week 20
Completion of poster, bench inspection presentation and final report writing.

C. Project Deliverables: (Indicate what should be completed at the end of the project e.g. this list should indicate what will be presented / demonstrated at the final bench inspections)

- The completed software of plasma simulation user-interface with detailed software handbook.

- The poster with significant achievements of this project.

- The software demonstration and presentation.

- The main functions will be displayed and introduced with the software and codes.

- The final report and relevant documents of this project.

D. A section on Project Rationale and Industrial Relevance must be included in the preliminary report (deadline midnight Friday 14th October 2016). This should explain how and why the project was devised, e.g. it may be a project sponsored by a company or linked to a research project.

Student Signature: Junming Zhang Date: 11/10/2016

Supervisor's Signature: Date: 11/10/2016

By signing this form, the supervisor and student are confirming that the project is of a sufficiently demanding nature that it is suitable for the individual project component of an accredited engineering degree and that a student, who is capable of producing a first class performance, will be able to demonstrate his/her capabilities in this project.