

Hello, everyone. My final year project Development of a C++-based user-interface for a plasma simulation tool. The presentation can be divided into 5 parts, Background theory, literature review, market survey, project planning, and progress made so far.

Firstly, I will talk about the background theory. My work is developing a user interface for a plasma simulation tool which called Plasimo and it has been developed by the technological plasma group. It supports transient and steady-state simulations of plasma sources and displays them in one, two and three-dimensional geometries. It's powerful for plasma researchers because they can observe the changing process of micro plasma directly. However, the numerical data are saved in 68 different text files. Compare these files to plasimo's menu, you will find it's hard to match them especially for new users. In addition, the simulation process is irreversible, once you running the program, you can only observe one property at one time and if you miss the time to check the diagram, the only way is to restart the simulation. By the way, this tool usually cost 6 minutes to finish one simulation and it could be very long if you change the code of model. Therefore, a user-friendly interface is needed to develop, it should solve these problems in the plasimo and provide some functions to dispose of related data. I will introduce this interface in the part of the progress made so far.

Secondly, I will introduce the literature review. I had read lots related papers in the university's library and I choose 1 paper to briefly describe here which is most related to my program design. It is the web-based user interface for EAST plasma control system. The report of this system describes the clear design process of the GUI and it provides me a good example of showing data in a line chart. Moreover, I have learned the procedures of developing interface: First is Drawing the user interface, and then processing user's requests, finally test and analysis it. And I also learned some principles of interface: operations should start with a suitable Workspace in the window because first view is important. All user actions can be triggered from the main menu because the design

should reduce the workload of the user. Therefore, to investigate user's requirements is important at beginning.

Then I'll move on to the Market survey. The aspect of my FYP is provided convenient to plasma researchers and industrial users who using the simulation tool. And in this project, Micro Discharge 2D (md2d) is the target model. It is a time- dependent model and the function of it is solve particle transport problem in conjunction. Compact Fluorescent Lamp is one potential to make money. Nowadays, these lamps are quite common in replacing normal lamps because of its high efficiency and lifetime. To investigate the breakdown reason of it, it needs the help of Plasimo and my project could provide assistance in this case. Therefore, it has some market survey but the main job of this interface is helping plasma researchers.

Next is the planning of my project, here is the Gantt chart in the preliminary report, my planning could be divided into 4 parts, preparation, Research work, Developing work and Report work. The sub-task in preparation and report work are similar to other students, the research work is related to learn knowledge of plasma and learn programming skills. The developing work describes the procedures of interface developing. You can aim to this black line, it is the date of today, and all the planning is progress on time. Preparation work, project specification, DSE assessment and preliminary report are finished in Week 3, UI design, programming study, preliminary interface and virtual logbook are finished in Week 11.

The last point is regard to progress made so far. I will show you my design of user interface and some result of programming. First I will show you the design of the main window, the user can read the basic operation of this interface first and start to use it, detailed guide and contact way can be also easily found in this window. Next is the main menu, the user can find their required property according to open the classified menu, moreover, the

user could custom their frequently-used property in the quick menu and directly open it. The biggest problem in plasimo is the irreversible simulated process, to solve this problem, I have recorded the videos of these changing process and match them to the properties and text files. I was prepare using Qt to develop this software but meet lots problem, therefore, I change to MFC to draw the UI based on the design, and program the action of them. I will show you current software now. When you load the output file, this system will open the information of this data first. And when you choose one property which you want to observe, the system will display the corresponding video and data in text file. The function of generating line chart based on data is still developing, it could only show the line without the coordinate system now. However, the layout of this window still needs improvement because I want to the user have more space to observe the effective data.

Today I give a summary of my First semester's work of FYP and I use five parts to introduce them. I think I need to end my presentation now. Thanks for your listening. If you have any question, I will be pleased to answer you!