BSCCS FINAL-YEAR PROJECT

STUDENT GUIDELINES: PART 1 (PROJECT PROPOSAL)

DEPARTMENT OF COMPUTER SCIENCE, CITY UNIVERSITY OF HONG KONG

1 PROPOSING YOUR OWN PROJECT

1.1 INTRODUCTION

All students who intend to undertake the final-year Project course in the following academic year are required to propose their own projects, and to negotiate support and supervision by members of staff.

The Project course allows you to integrate a variety of material learned in previous years and to demonstrate many of the skills listed below:

- Management of time and resources (e.g. the scope of the project should not exceed the time allocated for this course);
- Ability to work independently (e.g. conduct library searches);
- Ability to synthesize material obtained from, or skills acquired through, a wide variety of sources (e.g. previous courses, placement work, library searches, etc.);
- Ability to think independently (e.g. solve problems, design systems);
- Ability to produce a workable computer system that implements your solutions;
- Ability to communicate results orally, during presentation, and in writing, in the form of the final report.

It should be noted that:

- Implementation is a necessary component of the project content. **It is expected that at least 20% of the overall project effort be spent on some form of implementation (coding).** Proof of concept based on theoretical considerations alone is not acceptable as a viable final-year project.
- High grades are most often granted for work which shows clearly **what alternatives were considered and why the relevant design choices were correct**, rather than how any one design was implemented. Your project work should therefore **demonstrate that, apart from implementation, you are capable of analysis, design, writing test plans, testing and evaluation.**
- For students who have previously failed FYP and are retaking FYP, they are **not** allowed to use the same project as their previous FYP attempts. In other words, the same FYP topic cannot be selected again after a failed FYP.

1.2 PROPOSAL PROCEDURE

To propose your own project, you have to:

1. Choose an area of computing that you find interesting and would like to know more about. It may be something that you have observed during your placement work, or something which you have come across in your previous years of study. In any case this should be a topic you would like to further investigate, with a view to the construction of a relevant software prototype.
2. Decide why such an investigation and prototype would be advantageous or useful.
3. Describe the properties of the prototype you anticipate designing and implementing.
4. Consider what things you have to do, in order to arrive at the final result.
5. For your reference, a list of past project titles is available from the "Final Year Project Management System". **Samples of past project reports** are also available on the university e-Portal and/or in the Project Area of the Reserve Collection in the Library.
6. Note that the estimated time to be spent on the Project course is about 300 working hours. If necessary, go back to step 3 and reconsider exactly how much you can achieve in the available time without affecting your overall study plan.
7. Decide on the software and hardware you will probably use to construct the prototype.
8. Use the "Final Year Project Management System" to look up the areas of interest of staff members in the Computer Science Department.
9. Identify a member of staff with an area of interest that matches your preliminary project topic, and contact that person to discuss your ideas. (Note: The list of available potential supervisors is provided on the "Project Proposal" page.)
10. After discussions with the staff member who has agreed to help you with your proposal preparation, you can submit your project proposal through the "Final Year Project Management System", naming the staff member as the potential supervisor.
11. Note that your potential supervisor might ask you to make modifications to your proposal, before accepting it. It is also possible that your proposal is rejected by the potential supervisor, in which case, you need to submit a different proposal, or to contact a different potential supervisor.
12. All accepted proposals are subject to approval by the Project Committee.

1.2.1 CAUTION WHEN CHOOSING STAFF AS SUPERVISORS

The member of staff who helps you with your proposal is not guaranteed to be your supervisor. There is a limit to the number of projects which a staff member will supervise. This number varies from year to year, depending on the overall number of projects and supervising staff in each year. It is therefore possible that any delay on your part may result in the person you wish to choose no longer being available to help you.

1.2.2 AVOIDING PLAGIARISM

Similar projects within one cohort of students and repetition of past projects can be accepted provided that:

- You relate your proposal, and subsequent work, to these other projects by clearly pointing out the similarities and the differences between that work and your own work.
- You can demonstrate substantial improvement on past work.

It is **your responsibility** to ensure that someone else's work is duly acknowledged. **Failure to comply with this regulation, if noted, will be treated as plagiarism and handled accordingly.** A database of past and currently ongoing student projects is available at the department to facilitate the above-mentioned referencing.

1.2.3 INDUSTRY-BASED PROJECTS

An outside organisation (e.g. your current employer) may also be involved in helping you to develop your project proposal. In this case, you must inform the staff member whom you consult of that connection. The staff member and project coordinator will then help you negotiate the exact nature of your project, and will advise the organisation of any limitations which must be imposed, and particularly the fact that this must be **YOUR** project with you in control of all aspects of the work, and that no project outcomes or deliverables can be promised.

Note the following guidelines for industry-based projects:

1. The project should be “new”, and not something that has been done before. The project should have enough technical components for FYP, and not just helping the company develop a product.
2. All aspects of the project should be entirely controlled by the student.
3. The company cannot stop the student from reporting technical work in the reports.
4. The outcome (patent, technique) belongs to student. Any deviation from this needs to be mutually agreed by all the parties (student, supervisor, company, CityU KTO) **before** the project starts. an agreement should be sought between KTO, the company, the supervisor, and the student. For more information related to the IP issues, you may consult the UNIVERSITY POLICY ON INTELLECTUAL PROPERTY.
5. **The project report, and other components of assessment, should include all aspects of the project work (i.e. inclusive of the industry-related aspects), as a basis for assessment. In particular, any arrangements with industry should in no way compromise the quality of the project.**

1.2.4 GROUP PROJECTS

Group projects are acceptable if the work of individual students can readily be distinguished for purposes of assessment, and individuals' performances are not so dependent on one another that the failure of any one student will necessarily or directly jeopardize the work of any of the others. In other words, each student can work on a distinct component of the overall system, and the assessment of the student is based mainly on their own component. In addition, ***each sub-project should be substantial enough so as to be equivalent to a normal individual FYP.***

Group members need to submit separate (individual) reports to detail each student’s own contribution to the project. The assessment is mainly based on individuals’ work, except for two parts that are group assessment: 1) a group demo showing a full working system; 2) technical assessment on the full system design, integration, and testing. More details can be found in “Student Guidelines: Part 2 (Timetable and Assessment)”.

Proposals for group projects must contain an adequate degree of detail to be able to judge each student's involvement in, and contribution towards, the deliverables for the group project. It is therefore required that:

a) a separate project proposal is normally written for each student individually.

b) Group projects will only be approved if *the success of each student within the group can be easily distinguished from the success or failure of any other student within the group, and thus is not dependent on the success of any other student.* The inter-relationship between the individual's project and the overall group project should also be highlighted in the individual proposals.

c) each proposal must state clearly what the individual student(s) will be expected to achieve. This will allow the degree of overlap between related projects to be determined in the subsequent assessment of individuals.

d) Each sub-project of the group project should be equivalent to a normal individual FYP.

e) **When submitting the project proposals, group members must email the BSCS FYP Coordinator (csbsproj@cityu.edu.hk) that they are forming a group project.** The group project proposals will then be vetted by the Final Year Project Committee for appropriateness.

f) Group projects are expected to be substantial systems, and are highly encouraged to be submitted IT competitions.

When proposing a group project, please consider the following example feedback from the FYP Committee on previous group projects:

- *The roles of the two group members is not entirely clear, and there is overlap in the roles. Student A works on the market advice algorithm, and Student B builds a test case backend. This makes the 2nd project almost entirely dependent on the output of the 1st project, which is not acceptable. It seems the test cases for the algorithm should be generated by the 1st project since the algorithm needs to be tested anyways.*
- *No details are given about the specific roles of each group member. More details are needed. Which sub-systems / features will each group member develop?*
- *The project description says: "Different measures will be adopted in data collection and processing. And we will implement the measures from different aspects" - the delineation of sub-projects to group members is not clear enough. What measures? which aspects?"*
- *The group project description is "Each feature will be developed by at least two groupmates so that they can help each other when the other groupmate is not available." If 2 people are working on the same feature, then it will not be possible to do individual grading. The project needs to be separated into sub-systems / features that each groupmate will work on independently.*
- *Frontend / backend separation is okay, but each needs to be substantial enough as an individual project, i.e., each sub-project is expected to have a large number of features.*

2 SAMPLES OF PROJECT PROPOSALS

2.1 SAMPLE 1

Project Title	Sharing Taxi Fee Application
Subject Area	Big Data; Data Privacy; Database; Internet; Location-Based Technology; Mobile Application; Real-time Database Systems
Abstract	Although Hong Kong is a small city, people may still need to spend a lot of time in traffic if he / she want to go to a place by taking buses or trains because those transportation need to stop at multiple stations for passengers to get off. Alternatively, taking taxi service seems to be a good option because it can carry passengers to the destination directly.

However, most of time, people is reluctant to use this service because they cannot afford the expensive fee and this service may be in short supply during rush time. In order to encourage people to use more taxi service, grouping passengers who are going to the same direction at the same taxi stop to share the fare should be a good choice. Developing a mobile application is a possible and easy way to achieve group formation because everyone owns a phone nowadays. Grouping strangers together may be a critical challenge due to different destinations and distinct opinions towards making group decisions such as choosing an ultimate route and allow who join the group. By providing sufficient information for passengers to negotiate with each other, the goal of this application is to assist them to form a group among a short time efficiently and consequently share the taxi fare.

Objectives

1. Develop real time database to manage the passenger request;
2. Suggest the number of people and waiting time for forming a team by analyzing past data;
3. Suggest the meeting point for driver to pick the passengers;
4. Maintain the data privacy

Deliverables

1. Provide an application to help passenger to save money by sharing taxi fee

Hardware Requirements

Mobile Device: Android Phone; PC: Dell OptiPlex XE3;

Software Requirements

API: Google Maps API; Database: MySQL; Emulator: Android; OS: Android; SDK: Android

2.2 SAMPLE 2

Project Title

Code formatter and analysis engine for Minified JavaScript code

Subject Area

Programming Languages; Web development

Abstract

Nowadays JavaScript libraries are usually packed by Minifier so as to reduce download size. Though the code performs perfectly well, it is difficult for study and maintenance as the variable names and constructs were replaced by shorthands. In the project students will build an editor for automatic code formatting together with features for code analysis and maintenance(e.g. variable renaming, scope analysis...etc.)

Objectives

2. To investigate general types of JavaScript minification methods used now;
3. To look into code formatting methods with features for code analysis and maintenance;
4. To implement a prototype JavaScript Editor that can edit Minified JavaScript code with automatic code formatting, together with features for code analysis and maintenance

Deliverables

1. A review of general types of JavaScript minification methods used now;
2. A solution of code formatting methods with features for code analysis and maintenance;
3. To implement a prototype JavaScript Editor that can edit Minified JavaScript code with automatic code formatting, together with features for code analysis and maintenance

Hardware Requirements

PC: Dell OptiPlex

Software Requirements

OS: Microsoft Windows 10; Language: .NET Core 2.2 [Free]; IDE: Microsoft Visual Studio 2019

Updated on June 23, 2022, coordinated by Prof. Antoni Chan.