June, 2014

Dear members of the Queen's community,

Can you think of how some custom-made computer software could make your professional life easier? Are you willing to interact with smart, energetic 4th-year Computing students, describe your software needs to them, and serve as a “client” till April next year? If so, then you might just get that software for FREE...

The final year of our undergraduate program in Software Design in the School of Computing features a full-year 6 unit software project development course, CISC 498. Students are asked to put what they have learned into practise by designing and implementing a substantial piece of software from scratch. For this to work well, we need ideas for projects that address a real need and in which the software produced is actually going to be used (or at least serves as a prototype). The purpose of this note is to ask whether you have an idea for such a project.

YOUR PROJECT IDEA

Your project should fall within the following parameters:

- **Size**: CISC498 is a full-year course. Each project involves a group of up to 3 students.
- **Timing**: Projects run from September to April; software would be delivered to you in mid-April.
- **Contents**: To allow students to practise all their skills, your project should involve not only implementation, but also analysis and design. In other words, the required system should have somewhat interesting “requirements” (what the system is supposed to do) and require a somewhat interesting “architecture” (the high-level structure of the system). The point is that projects which consist solely of, for instance, software upgrades or installations, or web design, are not suitable, because they don't allow students to gather first-hand experience about the pitfalls and intricacies of collecting requirements and doing architectural design.
- **Scalability**: Frequently, the initial goals of a project may be too ambitious to finish under the constraints of an undergraduate course. You should feel free to pose whatever requirements are best for you, but be prepared to negotiate some smaller subset that is still useful to you.

EXAMPLE PROJECTS

In general, most suitable projects consists of

1. the input, manipulation or display of some data; the data may come from the user through the web or a GUI, or from some other application, and
2. the reliable and possibly secure storage of that data in a data base.

Here's a list of some projects we've had in previous years:

**Mark-Sheet Scanner via Webcam**: Scantron® technology is widely used to grade multiple-choice exams and tests on specialized forms. For Math exams, graders currently record the marks for each question on the front page of the exam, and then two staff members spend two days entering the grades. Instead, this system allows the instructor to create a custom front page with bubbles for possible grades for each question, and student ID. With that, graders can fill in the bubble for the grade on their question, and then each paper can be scanned in seconds by passing it in front of the mobile device's camera, and the mark recorded in a database far more quickly than with manual data entry.

**Wait-time Web Dashboard**: The project involved the development of a web application capable of displaying, storing, and analyzing real-time wait times for emergency rooms. Users of the application...
include decision makers in the health care system (e.g., to deploy more resources to certain hospitals) but also emergency room users (e.g., to seek out emergency rooms with low wait times).

**Drug Pharmacokinetics Computer Simulation Laboratory:** The goal of this project was to develop leading-edge computer software, which is platform-independent (to stand the test of time), that current and future learners (undergraduate and graduate pharmacology and toxicology programs and continuing medical education) can use in on-site tutorials or via distance education to understand and apply the basic principles of pharmacokinetics in today's world of drug therapeutics.

**Questionnaire Processing System:** This project involved design and development of software that allowed support staff in a children's health care treatment centre to enter the results of questionnaires into a secure database server and to run analyses on these questionnaires.

**Web-based Text Annotation Application:** The group developed a web-based application to help a professor teach the interpretation of texts. The teacher is able to upload a text for the class to study. Students can view and add to commentary on specific parts of the text.

**Post-processing and Analysis Software for Particle Sizing Equipment:** The software was intended to consolidate data from a laser particle size analyzer used to analyze data from rivers, lakes and sediment cores, and to aid in post-processing of the collected data.

**YOUR ROLE**
You do not have to be an expert in computers or software design. Your role basically is to act as the “customer,” that is, as somebody who needs something implemented, has a relatively good idea of what the software is supposed to do, but does not know/care about the details of the realization.

However, you must be willing to:

- Interact with the students with an appropriate frequency. Initially, these interactions typically would take the form of meetings. Later, it may be appropriate to replace some of these meetings with email correspondence.
- Attend two to three project presentations during the year. Currently the course time is scheduled as 8:30-11:30 on Wednesdays, but if that turns out to be difficult for you, it might be possible to schedule alternative presentation times.
- Provide input to the CISC498 coordinator (that is, me) with respect to grading.

If you think you have a suitable project or you just have more questions, drop me a line at dalamb@cs.queensu.ca, and we can negotiate an initial project description to give to the students.

Thanks,

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