MSc in Software development – Dissertations

Sample project topics from the 2020-21 cohort

1. A tool to support independent/self-directed learning within a discipline

The aim of this project is to develop a tool that helps learners to familiarise with concepts within a discipline/field as part of their independent/self-directed learning. The project is open-ended in that you may choose the discipline/field of study. One example in the context of learning programming is data structure/algorithm visualisation [1]. Another popular tool is Duolingo in the context of learning foreign languages [2].

The end-product must include functionality on the following aspects [3]:

- Assess readiness to learn;

- Set learning goals;

- Engage in the learning process; and

- Evaluate learning.

The target users will be learners and instructors within the proposed discipline/field of study. Requirements gathering and evaluation must involve users from this target audience. GUI implementation will be a "must-have" requirement. You will be allowed to choose the programming language and the GUI development framework, which may involve learning a new technology.

[1] https://www.cs.usfca.edu/~galles/visualization/Algorithms.html

[2] https://www.duolingo.com/

[3]   https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/tips-students/self-directed-learning/self-directed-learning-four-step-process

2. Careers search engine

At school and during the working life, it may be necessary to choose a career path that is non-obvious. Those at school and those thinking of changing career may be unaware of career paths and trends that are available. The project goal is to build a web application that provides career path suggestions based on a personality test, followed by a set of additional questions. These additional questions may include asking the user if they would be willing to learn a new subject area. The output of the search could be a graphical display that allows the user to filter the results and look at careers that are further from their skillset. Realtime filtering and postprocessing could be implemented.

The web application should be developed first as a minimum viable project. Following the deployment of the minimum viable project, additional features could be added as time allows. The development should be performed as several agile sprints, where a vertical slice of functionality is added during a sprint. Continuous integration and development should be used to compile, test and deploy the application automatically. The web application could be implemented using Python with Django or Flask, or using C# and .NET Core. Data for the application should be stored in an Elasticsearch database. The client-side display could use a JavaScript framework, such as Angular or React.