

COMP39/9900 Computer Science/IT Capstone Project

School of Computer Science and Engineering, UNSW

Project Number: P21

Project Title: University progression pathways visualisation and analysis

Project Clients: Stuart Prescott

Project Specializations: Software development; Web application development; Big data analytics and visualization.

Number of groups: 2

Background:

Students take lots of different pathways through our degrees - even in streams where there are not many electives, the order in which courses are taken is often not as designed, due to being enrolled part time, double degrees, failing courses, going on exchange, or simply just deciding against following the advised course sequence.

The goals of the project are to develop one or more tools that

- help visualise the paths that students take through their degrees
- help identify students who are taking unusual course sequences to be able to make contact for academic advising
- help predict course enrolments in subsequent courses based on typical pathways and prereqs having been met.

Requirements and Scope:

Pathways through the BE(Hons) degree; we can initially scope this down to just one or two streams. Building the tools flexibly enough that they can be applied to other programs and streams is necessary.

1. Loading data from standard sources; likely several years' of per-term SiMS enrolment records (de-identified or synthetic)
2. Visualisation on a course-by-course basis, e.g. sankey diagrams of pathways into and out of a target course
3. Visualisation on a stream basis, e.g. a graph with weightings
4. Visualisation/reporting of students who are off-plan
5. Summarisation/reporting tools of projected numbers of students who are eligible for courses in future terms based on progression/prereq requirements
6. Stretch goal... ML to predict numbers for next 3 terms based on historical trends and current term.

Required Knowledge and skills:

Data handling, cleaning etc - this will be database-backed

Data visualisation

UI design.

Expected outcomes/deliverables:

UI for enrolment data analysis - source code

Documentation of algorithms used to clean, link, visualise data

User guide for common tasks

Not prescriptive about the form of the UI as desktop app or web app - but be conscious that a real deployment would be touching student data classed as personal or sensitive.

Supervision:

Stuart Prescott

Additional resources:

We have some prototype queries to identify student progression issues that can be shared to provide examples. We have documentation for the data formats of the reports.