Exploratory Data Analysis on Student Retention

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Introduction

All post-secondary intuitions' main source of revenue is tuition from undergraduate studies. Student retention is key to the success of any institution, not only for revenue but for their reputation.
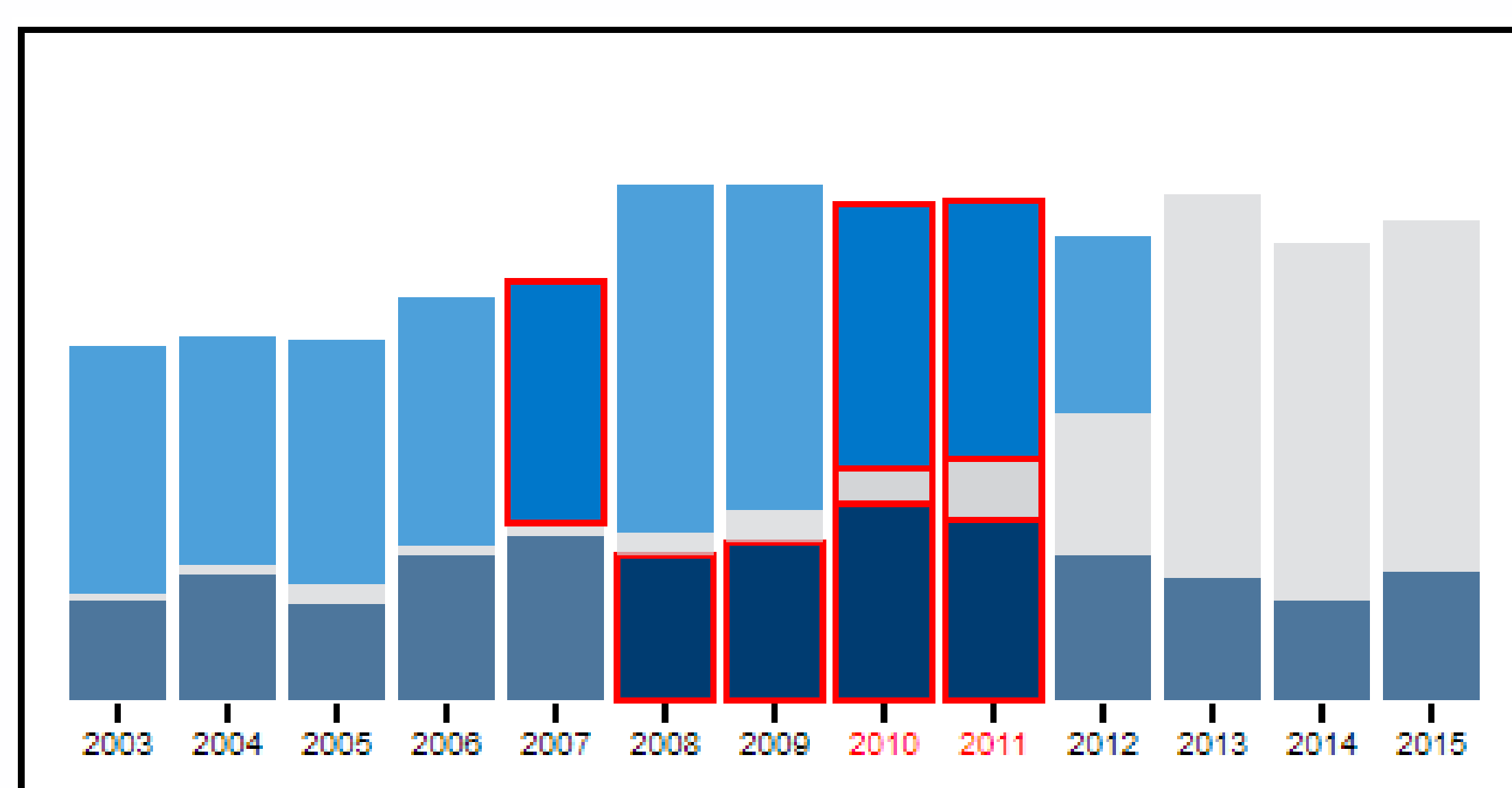
Selection being made on 'Admission Year' visualization to filter students admitted from 2007-2011; specifically students in 2007 which graduated, and students which dropped out in 2008 & 2009.

Research Needs

The UOIT Registrar's Office reached out to the vialab to build a to visualize student retention data for exploratory data analysis with an emphasis on patterns which are predictive of student withdrawal. The RetentionVis tool relies on user interaction through application of filters to the visualizations to assist the Registrar's Office to answer the question: *'Why are students dropping out?'*

Research Goals

Create a dashboard for the Registrar's Office which:
- Allow the analyst to freely explore the dataset.
- Aid the Registrar's Office in finding potential problems areas within student retention.
- Offer a wide range of filtration methods to investigate patterns or groups in the dataset.

Are withdrawal rates dependent on faculty?
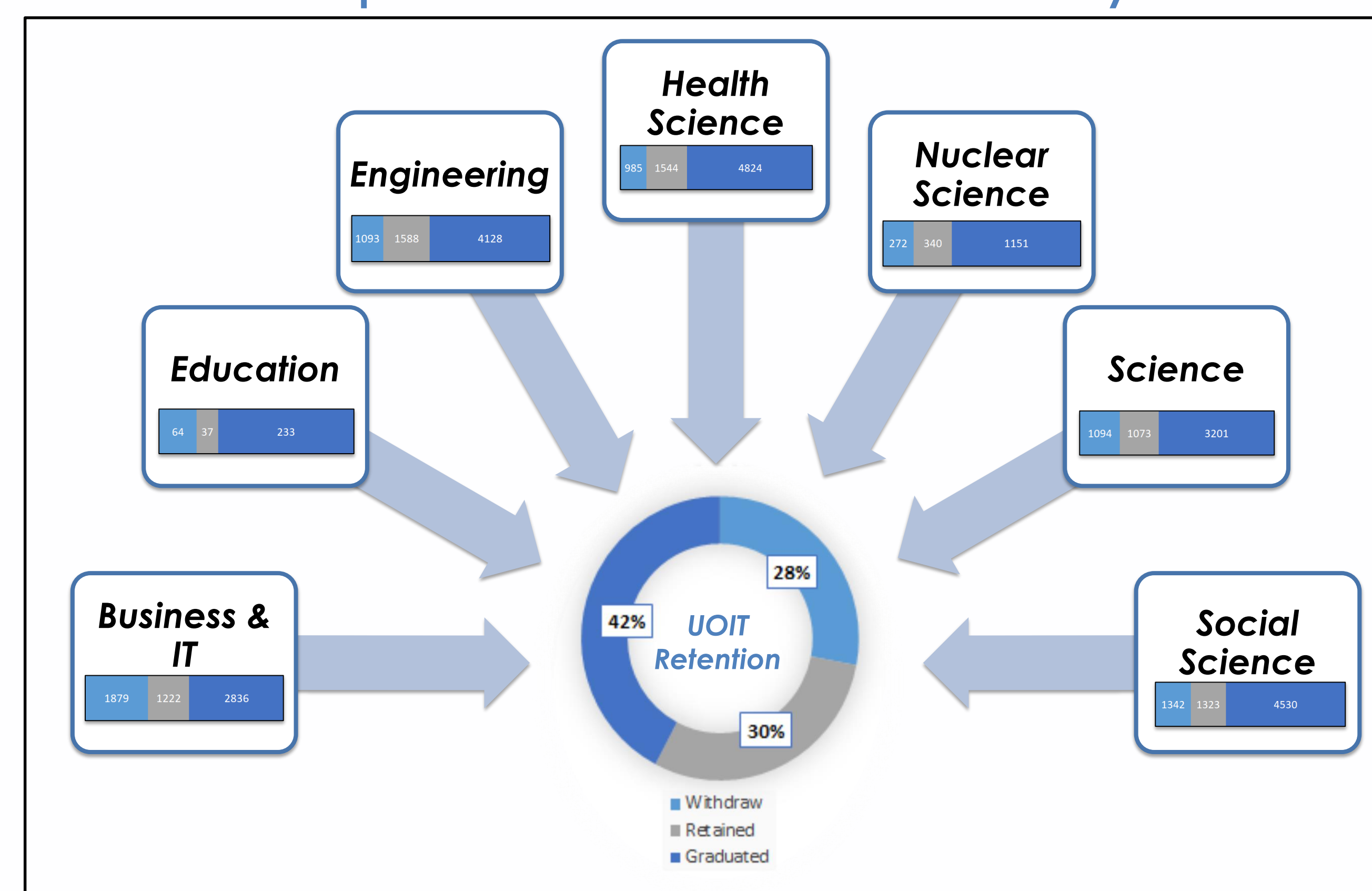

Why are students dropping out?

Problem areas in student retention aren't easy to uncover. The Registrar's Office cannot assume that the causation of a student withdrawing is dependent on a particular course, or professor. The RetentionVis tool can be used to find red flags in clusters of students.
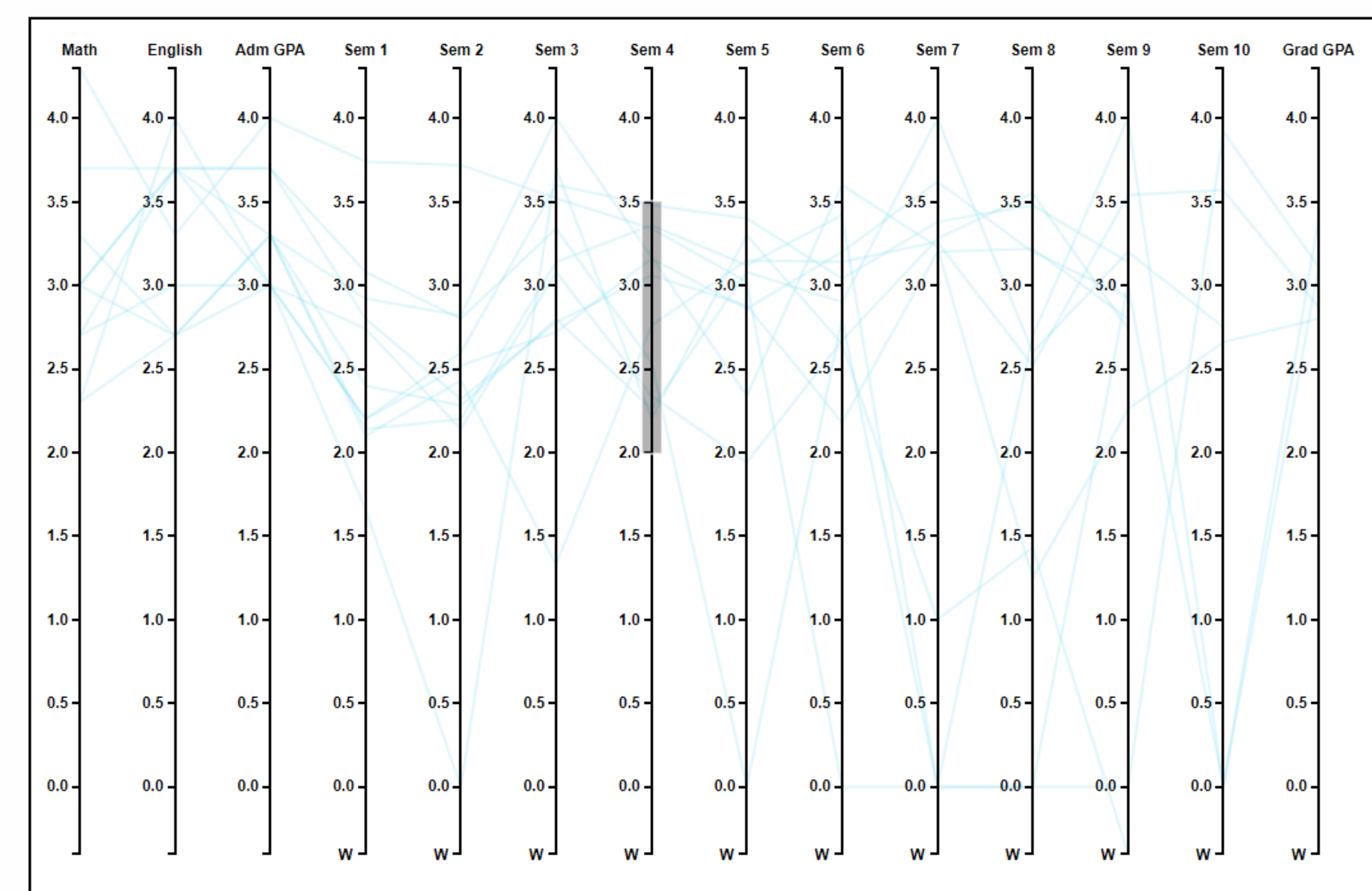
Visualization showing students' GPA performance per semester during their undergraduate path. Selection made to filter computer science students in 2008 who earned between a 2.0-3.5 in semester 4.

Dashboard Usage

The dashboard is an online interactive tool created in JavaScript's D3 library. The tool requires the user to make various selections including: faculties/programs, years, timeslots, and GPA ranges of interest with the goal of finding opportunities for improvement at UOIT.
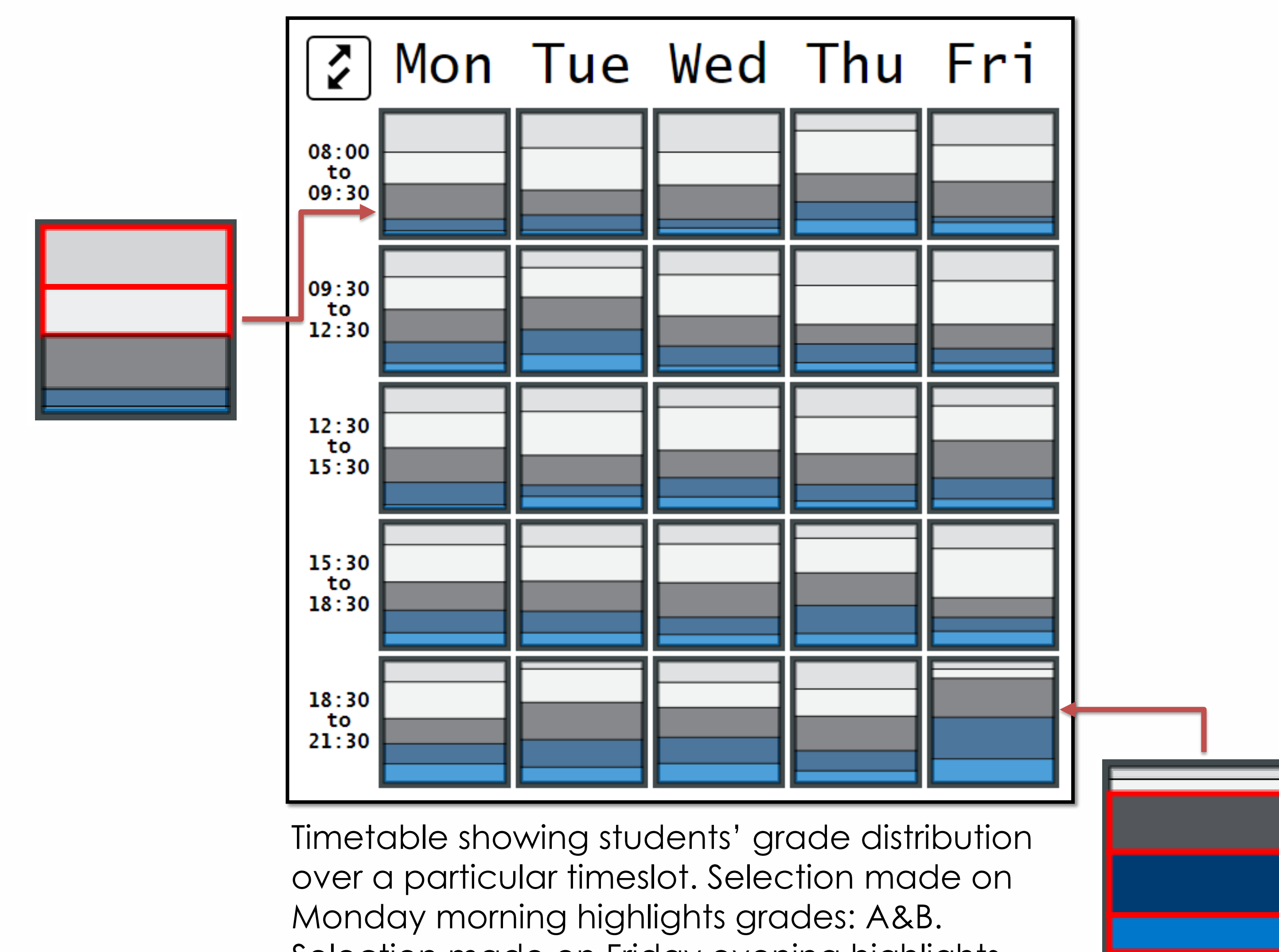
Timetable showing students' grade distribution over a particular timeslot. Selection made on Monday morning highlights grades: A&B. Selection made on Friday evening highlights grades: C,D&F.

Future Work

- Enhanced visualization to display course grade distributions, and how students perform following earning a particular grade in the course.
- Introduce clustering to group students based on their course performance and retention status.
- Implement machine learning to assist the Registrar's Office in searching for problem areas.