Student Retention: A Data Driven Approach

Riley Weagant Taylor Smith Christopher Collins

vialab • Faculty of Science • University of Ontario Institute of Technology

riley.weagant@uoit.net taylor.smith1@uoit.net christopher.collins@uoit.ca

Research Goals

Create visualizations that will:

- Assist in the decision making process with regards to student retention at UOIT
- Provide an interactive way to understand student data and trends
- Interact with each other to enhance usability
- Allow filtering by multiple factors to afford information discovery

Research Methods

Reviewing the literature was a natural starting point to our research in order to understand how other universities have tackled this issue. We then followed up with UOIT-specific retention documents. Interviews were conducted with Academic Advisors, Faculty Deans, Undergraduate Program Directors, and an Institutional Research Analyst. With the gathered information, we constructed visualizations that were specific to the needs of our school.

The Visualizations

Our visualizations were constructed using D3, a JavaScript library for manipulating documents based on data. We were given access to anonymized data for all students who attended UOIT from 2003 to 2014.

The timeslot visualization (Figure 1) shows letter grade distribution across all timeslots and faculties. It can be filtered by semester, year and faculty. The numbers in each box show the number of students in each timeslot, and are activated by a mouse hover.

The GPA visualization (Figure 2) shows a line for each student intersecting each axis at their GPA for that semester. Their final cumulative GPA is shown in a tooltip on hover.

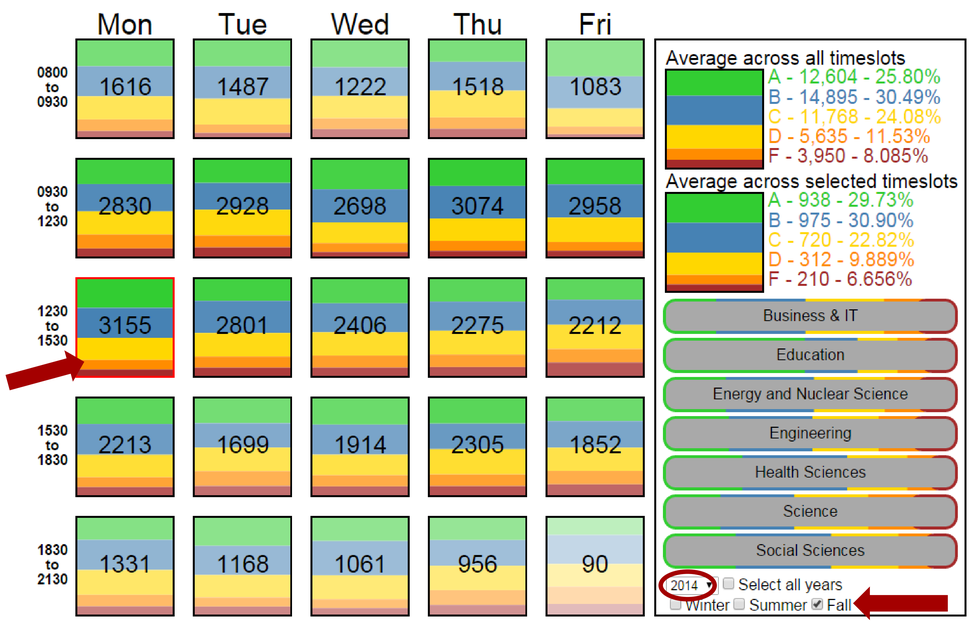

Figure 1: Timeslot visualization filtered to show Fall semester in 2014

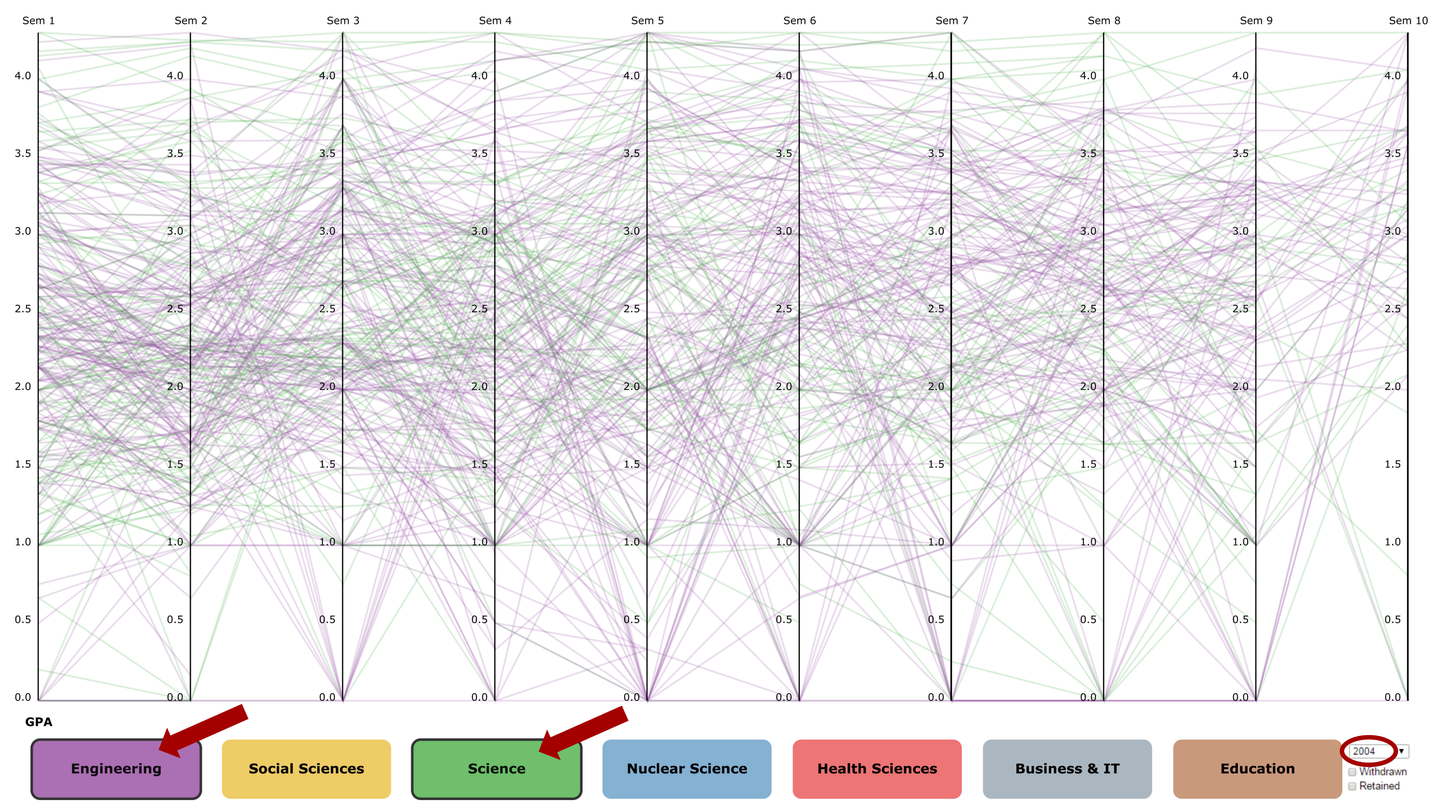

Figure 2: GPA visualization showing all students in the Faculty of Engineering and the Faculty of Science in 2004

Ongoing Research

We plan to integrate these two visualizations to allow the filters to work together. Since we have access to such a large amount of data, we also plan to construct more visualizations to show more information. We hope to use these visualizations as a starting point for an early-warning system to identify students who are at high risk of withdrawing.