

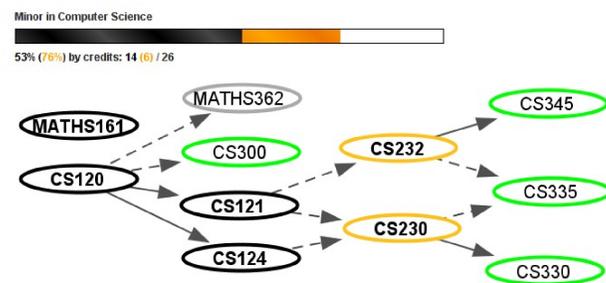
Usability testing of interactive curriculum visualization techniques

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Problem and Approach

Course catalogs, degree progress reports, and online course request systems are inadequate tools for helping students make curricular decisions. To address this problem I have been working with the information visualization research team to study the effects of visualization techniques on students' curricular understanding. These techniques are being implemented in CurricVis, a tool that assists students, curriculum designers, advisors and administrators in communicating and reasoning about curricula. The original version of CurricVis represented academic programs with static node-link diagrams. My contributions to CurricVis include the implementation of hypothetical mode, the progress bars, and the progress view.

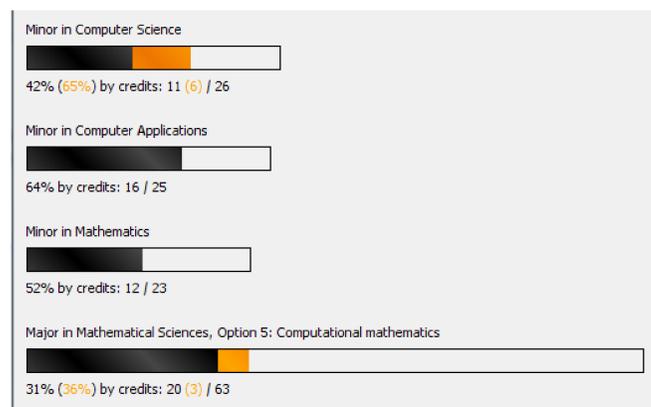
Hypothetical mode, progress bars, and progress view



The orange courses are hypothetically taken courses.

To facilitate curricular planning, CurricVis employs a "hypothetical" system that allows students to mark courses as hypothetically complete. Hypothetical mode helps students visualize the effects of their curricular decisions.

The progress bars distinguish between real and hypothetical progress, and a separate view displays the progress bar of each program in which the student has made progress (sorted from most progress made to least). This progress view is especially useful for students still exploring programs.



Current status

Usability analysis: user testing is in progress. A control group (using only traditional modes for curricular communication) and an experimental group (using CurricVis) are being compared via measurements of confidence, speed, and accuracy in making curricular decisions. This project proposes that students using CurricVis will score higher in all three categories.

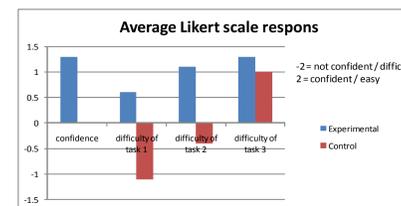
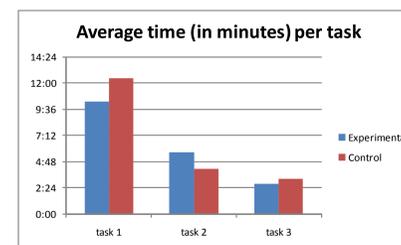
Usability testing

The primary focus of the user studies is to test the efficacy of using interactive curriculum visualizations to communicate about curricula. We do this by comparing the confidence, accuracy, and speed of individuals in our control and experimental groups while they complete the same set of three tasks. The control group has access to a course catalog, a DAPR generated specifically for the questions, and the online shopping cart. Those in the experimental group have access to CurricVis as well as the other resources.

Preliminary quantitative analysis

Even after one week of testing (22 participants) we can see trends in the data being collected. At first glance, the average time it takes for each group to complete the tasks seems disappointingly similar. However, we must factor in the usability and learnability of CurricVis. This study is more concerned with the efficacy of interactive curriculum visualizations than with the usability of CurricVis itself. If it turns out that CurricVis has too much of an impact on completion times, then we may need to alter the study to compensate.

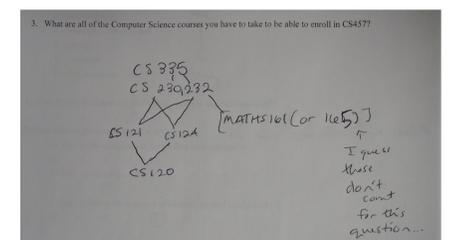
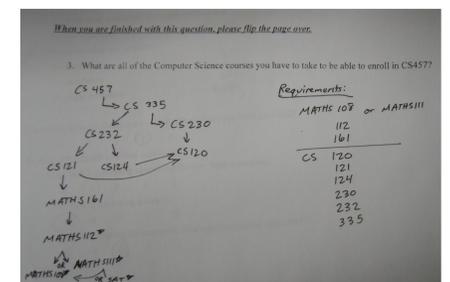
Comparing the responses to the Likert scale is significantly more interesting: the subjects of the experimental group are clearly more confident with their answers, and have found the questions to be easier overall.



Other interesting results

Over the course of the user testing we have noticed several surprising events. The images to the right are hand-drawn graphs that two subjects in the control group constructed to help them answer a prerequisite question. These graphs support our original hypothesis that node-link graphs are the most natural for expressing curricular data.

I demonstrated CurricVis to each of the control group subjects after they completed their tasks. Every one of them so far has agreed that CurricVis would have been much more helpful than the tools they were given.



Future work

This work leads to insights into the development of interactive visualizations for complex systems and the integration of usability analysis with information visualization research. The ultimate goal of this work is to make the software and techniques we develop available to any institution. Using CurricVis to represent curricula would reduce the current cost of supporting curricular reasoning among students, curriculum designers, advisors, and administrators by improving the efficacy of advising in higher education.

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