

Visualizing UW Prerequisite Course Sequences

CSE 512: Final Project

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Dylan Babbs & Jordan Starkey

Problem

Navigating the UW course catalog can be a difficult task. Courses are listed in an outdated HTML page providing only **minimal detail** about prerequisite information. The course description lists the prerequisites necessary in order to enroll, however, the description lists **only the first degree** of prerequisites required. For example, CSE 373: Data Structures and Algorithms, lists CSE 143 as the only required prerequisite. Unbeknownst to a student browsing the catalog, CSE 143 requires CSE 142 as a prerequisite. Therefore, the prerequisites needed to enroll in CSE 373 are **both CSE 142 and CSE 143**.

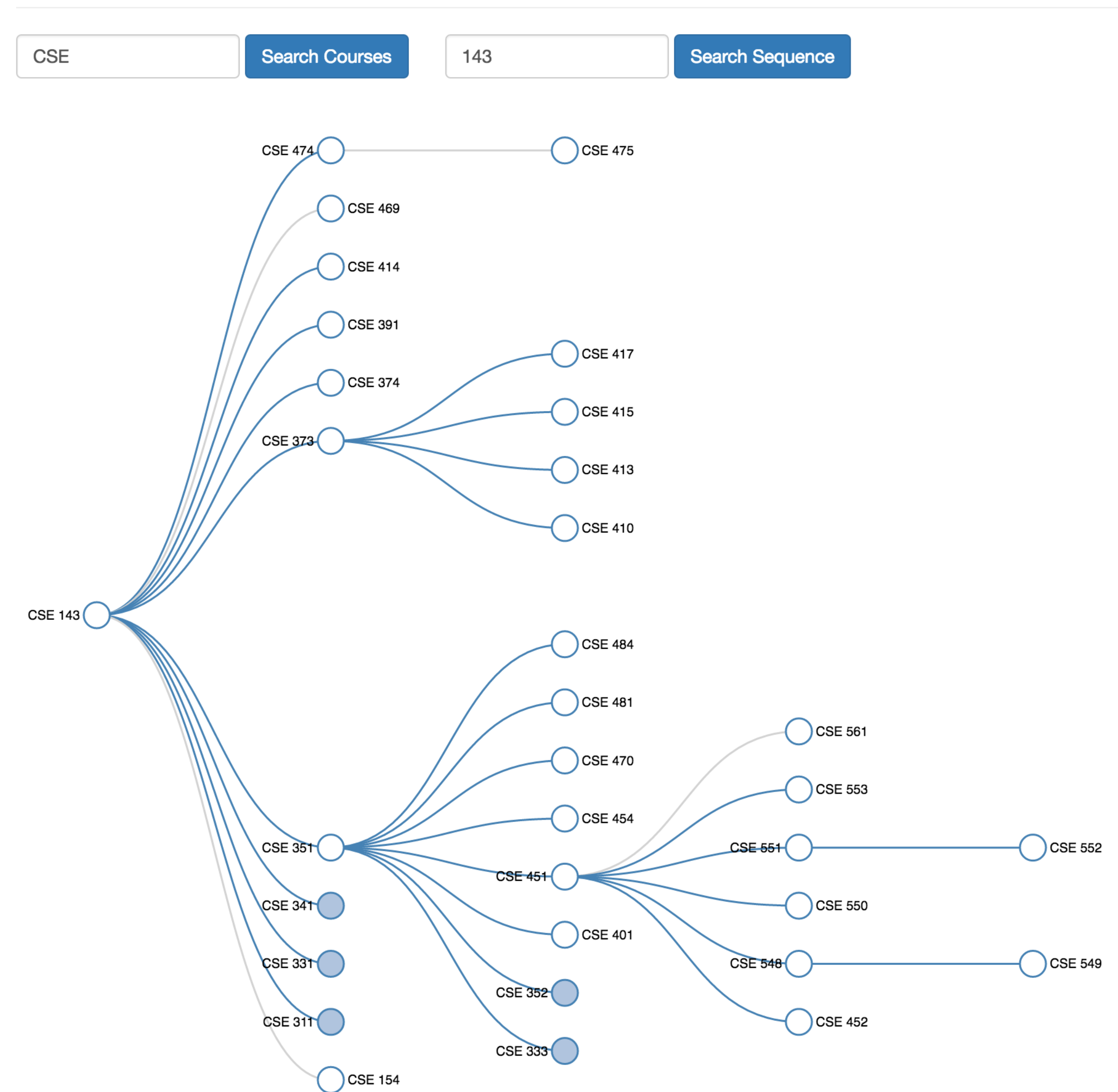
Motivation

Coursework planning can become a headache within minutes of browsing the course catalog. The goal of this tool is to **improve degree and coursework planning transparency** by providing an intuitive visualization experience using trees. All the user is required to do is input a course in order to view the sequential courses series. The user's course input becomes the node of the tree, and the node's children become the "post"-requisites of the course. Without this tool, students are forced to trace their course sequences in reverse to find course's second (or higher) degree prerequisites.

Results

UW Course Sequence Explorer

Explore the University of Washington's course catalog through dynamic trees.



Course Search: User inputs department name and course number to create tree visualization.

Color: Optional and recommended prerequisites pathways are encoded in gray.

Tooltip: Hovering upon a node provides additional detail (title, description, credit count, and credit type).

Expand & Explore: User can expand the subtrees of children by clicking on the nodes.

Approach

Creating the visualization required two main steps: **aggregating the entire course catalog** and **building the tree visualization** with D3.js. The python web scraper crawled department's offering pages to collect available course information (**title, credit count, credit type, description, and prerequisites**) in order to recursively create a nested JSON file. The JSON file was structured as a pyramid; each course's "post"-requisite courses were nested as children in the root node. Secondly, to create the visualization trees, we implemented the D3 tree layout.

Future Work

The tool can be expanded into two major capacities: **degree planning integration** and **user academic progress integration**. In terms of degree planning, the tool would show **classes required for graduation** (through integration with UW's graduation requirement page). Upon landing, the user would be prompted to select their academic program. Secondly, the ability to input previously enrolled courses creates a **personalized experience** for the user. For example, the tool would filter previously enrolled coursework to reduce clutter and focus upon only courses a user is interested in.

