ALGORITHM ANIMATION IN THE CLASSROOM

TUTORIAL PRESENTATION

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Systems for illustrating or animating algorithms are available for use in teaching computer science courses. These systems display representations of the algorithm's data structures or code, and update or animate the representation to show the effect of executing the algorithm. It is hoped (although surprisingly not yet proven) that such support will improve students' learning and understanding.

Undergraduate instruction involving algorithms usually includes some visual component, which generally illustrates data structures. The goal of this visual presentation is to supplement textual and verbal approaches by appealing to students' mental models, which may well be visual. Since software data structures are dynamic objects, it seems reasonable that use of animated visualizations will contribute to understanding. Research also suggests that there may be some limits to the effectiveness of this approach that must be considered when incorporating visualizations and animations into the curriculum.

In this tutorial, we will begin by composing a 'wish list' of features of an ideal instructional algorithm animation system; we will then review several systems to see how well they answer the needs of a classroom. We will be demonstrating visualizations from a wide variety of systems, and will develop one such visualization from scratch, much as an instructor might do, in order to show the details of using a specific system.

The effectiveness of such systems is just beginning to be explored. We will review some current work examining the impact of using an animation system in an undergraduate course.

Throughout the tutorial we hope to have audience participation, in order to combine teaching expertise with the possibilities of algorithm animation. Participants will leave with a good understanding of what is available (in many cases for no cost), and how they might incorporate algorithm animation into their courses.