EFFECTIVE USE OF ALGORITHMS IN ACTION WEB SITE*

TUTORIAL PRESENTATION

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Students are required to learn many different sorting and searching techniques in CS1, CS2, and Data Structure courses. The use of algorithm visualization tools can enhance the learning process for many students. Consequently much time and effort has been spent in developing algorithm visualization tools that can help demonstrate how different algorithms work. Many different methods have been presented at recent SIGCSE conferences and have been made available on the Internet.

Algorithm Animation is particularly valuable in data structure courses if:

- The algorithms that are animated are ones covered in the class.
- There are a sufficient number of algorithms included so that the time needed to learn the tool is not excessive.
- The code or pseudo-code being executed and the animation progress are visible at the same time.

- An explanation is available at each step if the student needs it.
- Execution can be stopped, backtracked, and/or reset when necessary.
- Multiple views of the data are available, particularly in algorithms where the storage view and the structure views may be quite different logically.
- The animation reflects the complete logic of the algorithm being studied.

This tutorial will feature a hands-on experience for all participants. The public site, www.cs.mu.oz.au/aia/, includes animations for heapsort, quicksort, 2-3-4 trees, radix trie, multi-way radix trie, and skip lists. A password-restricted site includes these animations and many other sorting and searching algorithms. The password site will be available for all participants. The algorithms are implemented using algorithm descriptions contained in Robert Sedgewick's *Algorithms* books.

Linda Stern, one of the conference guest speakers, is one of the coordinators for the *Algorithms in Action* web site. This site is particularly effective for visualization of different sorting and searching algorithms.

Mary Russell has been using the web site in her Data Structures class for three years, both in a closed lab and for homework assignments when introducing new algorithms. Data Structure students have indicated that the animations have been extremely helpful in improving their understanding of the algorithms.

Jeff Richards, Eric Ruggieri, and Chris Severino are students who have used the web site in class. They are among the many students who felt the web site was a valuable tool for the study of sorting and searching algorithms.