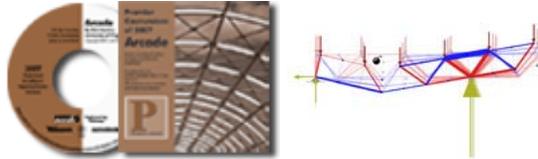


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Engineering Pathway, University of California at Berkeley

Arcade Courseware 2007 Premier Award Winner

The 2007 Premier Award for Excellence in Engineering Education Courseware was awarded to Kirk Martini of the University of Virginia for [Arcade: Interactive Non-linear Structural Analysis and Animation](#).



2007 Premier Award courseware was distributed on CD ROM at the FIE conference and is also available online.

The award was presented at the Premier Award Ceremony at the [Frontiers in Education conference](#), held this year in Milwaukee, Wisconsin. This year's panel of judges comprised a diverse cross-section of experts in engineering education and interactive media. Sponsors this year are John Wiley & Sons, In., Microsoft Research, Autodesk and TechSmith.

Arcade is a computer program for the simulation and animation of physical structures. *Arcade* uses a physics engine to model structural behavior. The physics engine models a collection of masses in motion, and can include several potential sources of force, including gravity, viscous drag, surfaces, plus springs connecting the masses. The program performs computations in real time, so that models respond instantly to input from the keyboard and mouse with a game-like interface. This approach has been widely used in computer graphics and games.

Jose Gomez of the University of Virginia's Department of Civil Engineering has commented: "*Arcade* puts into graphical format what words just simply cannot convey. These kids have grown up with sophisticated graphics in their computer games so this is a wonderful educational tool." Jim Axley of Yale University's Department of Architecture said of *Arcade*: "the value of examining dynamic, material nonlinear, geometric nonlinear, and failure behavior in such a natural, direct way clearly opens up new possibilities for teaching."

Two Finalists were also announced – *Jeliot 3* and *JFLAP*. [Jeliot 3](#) by Niko Myller, Andrés Moreno Garcia, Roman Bednarik and Erkki Sutinen of the University of Joensuu; and Ronit Ben-Bassat Levy and Mordechai Ben-Ari of the Weizmann Institute of Science is a program animation system intended for teaching introductory programming. The animation is fully automatic and requires no modification of the source program or other intervention by the student or instructor. Students can execute the animations continuously or step-by-step.

Niko Myller uses ". . . *Jeliot* during lectures to demonstrate different concepts of programming. This allows showing of concepts in real situations as well as doing simple

what-if analyses based on the questions raised during discussions in the class. Furthermore, students can use *Jeliot* to complete their homework and for self-study."

[JFLAP 6.1](#) was developed by Susan H. Rodger of Duke University and her current and former undergraduate students Thomas Finley, Stephen Reading, Bartlett Bressler, Ryan Cavalcante, Jinghui Lim, Chris Morgan, and Kyung Min (Jason) Lee. *JFLAP* is a software tool for experimenting with finite automata, pushdown automata, Turing machines, grammars, parsing and L-systems. In addition to constructing and testing theoretical machines, *JFLAP* allows computer science students and faculty to experiment with construction proofs, such as converting a pushdown automaton to a context-free grammar.

Susan Rodger recommends using "this software in a formal languages and automata course during lecture to work problems with students. Students can then use it for solving homework problems." Susan and Thomas Finley have also authored a *JFLAP* book that can be used as a supplement to most automata theory textbooks.

The Premier Award competition, hosted by the NEEDS/Engineering Pathway digital libraries, is open to a wide range of submissions of "high-quality, non-commercial courseware designed to enhance engineering education." Submissions for 2008 are due by July 11, 2008, and the Premier Courseware of 2008 will be announced at the Frontiers In Education Conference to be held October 22-25 in Sarasota Springs, New York. More details on the Premier Award and current and previous winners can be found on the Engineering Pathway at: <http://www.engineeringpathway.com/ep/premier/>

The [Engineering Pathway](http://www.engineeringpathway.com) (www.engineeringpathway.com) is a portal to high-quality teaching and learning resources in applied science and math, engineering, computer science/information technology and engineering technology, for use by K-12 and university educators and students. Engineering Pathway is the engineering education "wing" of the [National Science Digital Library \(NSDL\)](#) .