PRINCETON ACM / IEEE-CS CHAPTERS
FEBRUARY 2011 JOINT MEETING

Algorithms for the Masses

Robert Sedgewick

Before the advent of computing, a standard science and mathematics curriculum emerged in secondary education, supported and expanded by first-year college courses, that serves as the technical basis for every student in science and engineering. For whatever reason, we have seen two unfortunate developments at the dawn of the new millennium. First, many computer science students have somehow been exempted from having to know basic precepts of science (instead, they learn about developing large programs and about theoretical issues). Second, many students in science and engineering have somehow been exempted from being exposed to basic precepts of computer science and algorithmics (instead, they learn a few specific programming tools). In both cases, students are being shortchanged.

This talk will be a progress report on nearly four decades of work towards bringing the study of algorithms into the mainstream, with diversions into computer science education, research on analytic combinatorics, and speculation on the future of publishing, all with significant implications for algorithms research. First, applications from all fields of science and engineering now provide direct motivation for the study of algorithms, and a host of fascinating problems that students can address by implementing algorithms on their own computers. Second, analytic combinatorics now gives universal laws of sweeping generality that provide the key insights needed to understand algorithm performance from a scientific viewpoint. Third, the web now enables researchers to easily share problems, data, and algorithm implementations. Applying and developing effective algorithms is now the path of choice to address a broad variety of complex problems that face modern researchers in all fields---our task is to provide them both with an appreciation for algorithm design as an intellectual endeavor and with the algorithms they need.

The bottom line is that integrating the study of algorithms into the education of every student (and thus making modern scientists and engineers as comfortable with computational models as with mathematical models) is now much easier than it might seem. The growing number of people who can take advantage of this knowledge hold the key to the future.

Robert Sedgewick is William O. Baker Professor of Computer Science at Princeton and a member of the board of directors of Adobe Systems. He has held visiting research positions at Xerox PARC, Institute for Defense Analyses, and INRIA. Prof. Sedgewick's research interests include mathematical analysis of algorithms, design of data structures and algorithms, and program visualization. He has published widely in these areas and is the author of many books. His latest books are *An Introduction to Programming in Java—An Interdisciplinary Approach* (with Kevin Wayne), *Analytic Combinatorics* (with Philippe Flajolet), and (with Kevin Wayne) a new 4th edition of *Algorithms*, the latest in a series that has sold over one-half million copies.

Date:	Thursday, February 17, 2011, 8:00 pm. (Refreshments and networking at 7:30 pm.)
Place:	Small Auditorium, Room CS 105 Computer Science Building, Princeton University Olden St. between William St. and Prospect Ave. +40.3502,–74.6522
Information:	Dennis Mancl (908) 582-7086, Jan Buzydlowski (610) 902-8343
On-line info:	**http://www.acm.org/chapters/princetonacm**

All ACM / IEEE-CS meetings are open to the public. Students and their parents are welcome. There is no admission charge, and refreshments are served.

A pre-meeting dinner with the speaker is held at 6:00 p.m. at Ruby Tuesday's Restaurant on Route 1. Please send email to **princetonacm@acm.org** in advance if you plan to attend the dinner.