COMMUNICATIONS OF THE ACM

Departments

5 Editor's Letter
Fumbling the Future
By Moshe Y. Vardi

6 Letters To The Editor
Free Speech for Algorithms?

11 In the Virtual Extension

12 BLOG@CACM
Scientists, Engineers, and Computer Science; Industry and Research Groups
Mark Guzdial discusses what scientists and engineers should know about computer science, such as Alan Kay's "Triple Whammy." Greg Linden writes about industry's different approaches to research and how to organize researchers in a company.

14 CACM Online
Time to Change
By David Roman

31 Calendar

105 Careers

Last Byte

109 Puzzled
Solutions and Sources
By Peter Winkler

112 Future Tense
Catch Me If You Can
Or how to lose a billion in your spare time...
By Gregory Benford

News

15 **Grid Computing's Future**
Outreach programs and usability improvements are drawing many researchers to grid computing from disciplines that have not traditionally used such resources.
By Kirk L. Kroeker

18 **Twitter as Medium and Message**
Researchers are mining Twitter's vast flow of data to measure public sentiment, follow political activity, and detect earthquakes and flu outbreaks.
By Neil Savage

21 **Evaluating Government Funding**
Presidential report asserts the value of U.S. government funding and specifies areas needing greater focus.
By Tom Geller

22 **Memristors: Pass or Fail?**
The device may revolutionize data storage, replacing flash memory and perhaps even disks. Whether they can be reliably and cheaply manufactured, though, is an open question.
By Gary Anthes

25 **Gary Chapman, Technologist: 1952–2010**
He raised important public issues, such as the impact of computers and the Internet on society, and encouraged social responsibility for computer professionals.
By Samuel Greengard

Viewpoints

26 Legally Speaking
Do You Own the Software You Buy?
Examining the fine print concerning your rights in your copies of purchased software.
By Pamela Samuelson

29 Computing Ethics
Surrounded by Machines
A chilling scenario portends a possible future.
By Kenneth D. Pimple

32 The Profession of IT
Managing Time
Professionals overwhelmed with information glut can find hope from new insights about time management.
By Peter J. Denning

35 Broadening Participation
A Program Greater than the Sum of Its Parts: The BPC Alliances
Changing the trajectory of participation in computing for students at various stages of development.
By Daryl E. Chubin and Roosevelt Y. Johnson

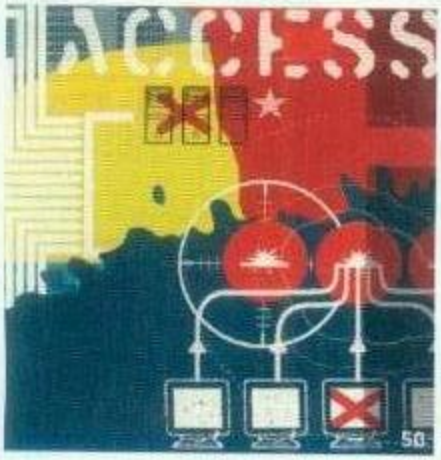
38 Viewpoint
Computer and Information Science and Engineering: One Discipline, Many Specialties
Mathematics is no longer the only foundation for computing and information research and education in academia.
By Marc Snir

VE **Reaching Out to the Media: Become a Computer Science Ambassador**
Why computer scientists should come out from "behind the scenes" more often and work with the media to draw public attention to their fundamental innovations.
By Frances Rosamond et al.

Association for Computing Machinery
Advancing Computing as a Science & Profession

03/2011
VOL. 54 NO. 03

Practice



44 **Testable System Administration**
Models of determinism are changing IT management.
By Mark Burgess

50 **National Internet Defense—Small States on the Skirmish Line**
Attacks in Estonia and Georgia highlight key vulnerabilities in national Internet infrastructure.
By Ross Stapleton-Gray and William Woodcock

58 **B.Y.O.C (1,342 Times and Counting)**
Why can't we all use standard libraries for commonly needed algorithms?
By Poul-Henning Kamp

Articles' development led by ACM QUEUE
queue.acm.org

Contributed Articles

60 **Plug-and-Play Macroscopes**
Compose "dream tools" from continuously evolving bundles of software to make sense of complex scientific data sets.
By Katy Börner

70 **Understanding Scam Victims: Seven Principles for Systems Security**
Effective countermeasures depend on first understanding how users naturally fall victim to fraudsters.
By Frank Stajano and Paul Wilson

VE **The Internet Electorate**
The 2008 U.S. presidential election demonstrated the Internet is a major source of both political information and expression.
By R. Kelly Garrett and James N. Danziger

VE **Governing Web 2.0**
Grounding principles to get the most out of enterprise 2.0 investments.
By Steven De Hertogh, Stijn Viaene, and Guido Dedene

Review Articles

76 **Data Structures in the Multicore Age**
The advent of multicore processors as the standard computing platform will force major changes in software design.
By Nir Shavit

Research Highlights

86 Technical Perspective
Concerto for Violin and Markov Model
By Juan Bello, Yann LeCun, and Robert Rowe

87 **The Informatics Philharmonic**
By Christopher Raphael

94 Technical Perspective
VL2
By Jennifer Rexford

95 **VL2: A Scalable and Flexible Data Center Network**
By Albert Greenberg, James R. Hamilton, Navendu Jain, Srikanth Kandula, Changhoon Kim, Parantap Lahiri, David A. Maltz, Parveen Patel, and Sudipta Sengupta

About the Cover:
Artist/photographer Eric Fischer created the Geotaggers' World Atlas by collected geographical data from Flickr photos, revealing where people take pictures in major cities around the world. Each city was ranked on the density of photographs taken around its center; our cover image of New York City topped the list.