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The Association for Computing Machinery
Advancing Computing as a Science & Profession

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ACM HONORS COMPUTING INNOVATORS

**Award Winners Made Breakthroughs in Network Efficiency, Data Mining, Education, Game Theory,
Programming, and Community Problem-Solving**

NEW YORK, NY, April 9, 2013—ACM (the Association for Computing Machinery) today announced the winners
of six prestigious awards for their innovations in computing technology. These innovators have made significant
contributions that enable computer science to solve real world challenges. The awards reflect achievements in computer
networks, information retrieval, computer science education, multiagent systems, versatile compiler technologies, and
computer-human interactive technologies. The 2012 ACM award winners, from internationally known research and
academic institutions, include prominent computer scientists, educators, and entrepreneurs.   ACM will present these and
other awards at the ACM Awards Banquet on June 15 in San Francisco, CA.

The 2012 Award Winners include:
- **Martin Casado and Dina Katabi**, recipients of the Grace Murray Hopper Award for advances in network
  efficiency.
  Casado helped create the Software Defined Networking (SDN) movement, an approach that provides a software
  alternative to hardware-based network components. He introduced an open interface (OpenFlow) and open-
  source software components, which uncouple the network from its hardware. This level of abstraction creates
  virtual networks that are able to deliver the same features as physical networks, but with the operational flexibility
  of virtualization. These innovations, readily and widely adopted by industry, have spawned a burgeoning SDN
  research community with the potential to change the field. Casado was Co-founder and Chief Technology Officer
  of Nicira, which was acquired by VMware in 2012. He is currently the Chief Network Architect of VMware as
  well as a consulting assistant professor at Stanford University.

  Katabi initiated a new approach to network design using an explicit Control Protocol (XCP) that minimizes
  network congestion and maximizes utilization efficiency. Her research addressed a strategic technological
  problem of Internet growth, which requires extreme scalability and robustness. She developed XCP, an algorithm
  to ensure fair allocation of capacity among different flows that compete for the same Internet bandwidth.   Her
  scheme is the first protocol to achieve both goals simultaneously without imposing excessive per-flow overhead
  on Internet routers. The design separated the efficiency and fairness policies of congestion control, which
  delivered the highest possible application performance over a broad range of network infrastructure. Katabi is a
  professor at MIT and a member of its Computer Science and Artificial Intelligence Laboratory (CSAIL). She
  leads the Networks@MIT research group, and is director of Wireless@MIT, the MIT center for wireless networks
  and mobile computing. *The Hopper Award recognizes the outstanding young computer professional of the year.*

- **Andrei Broder, Moses Charikar, and Piotr Indyk**, recipients of the Paris Kanellakis Theory and Practice
  Award for algorithms that allow for quickly finding similar entries in large databases, known as locality-sensitive
  hashing (LSH). These algorithms can drastically reduce the computational time needed for retrieving similar
  items, at the cost of a small probability of failing to find the absolute closest match. LSH has impacted fields as
  diverse as computer vision, databases, information retrieval, data mining, machine learning, and signal
  processing. Andrei Broder introduced specific locality-sensitive min-hash functions, used to estimate the
  similarity of data sets and identify near-duplicate documents. He is a Google Distinguished Scientist. Piotr

Indyk, with the late Rajeev Motwani, extended LSH functions to a wider range of distance functions, and applied them to design efficient approximate nearest neighbor algorithms. Indyk is a professor at MIT's Computer Science and Artificial Intelligence Lab. Moses Charikar introduced sim-hash functions for angular distances. He is a professor of Computer Science at Princeton University. *The Kanellakis Award honors specific theoretical accomplishments that significantly affect the practice of computing.*

- **Eric Roberts**, recipient of the [Karl V. Karlstrom Outstanding Educator Award](#) for his contributions as an international leader in computer science education, including numerous contributions to curriculum development. Roberts is the author of several exemplary textbooks. His first book, *[Thinking Recursively](#)*, was named in a 1998 *Communications of the ACM* survey as one of the core texts that every computer science educator should know. At Stanford University, Roberts built an undergraduate computer science program staffed by a team of effective teachers, which has become a model for universities across the country. He developed a computing curriculum for public high schools in Bermuda that was the first national computing curriculum to be certified by an international standards board. He served on the board of the ACM Special Interest Group in Computer Science Education (SIGCSE) and is the immediate past chair of the ACM Education Board. Roberts received the SIGCSE Award for Outstanding Contribution to Computer Science Education. He is a Fellow of ACM and the American Association for the Advancement of Science (AAAS). Roberts is a professor of Computer Science at Stanford University. *The Karlstrom Award recognizes educators who advanced new teaching methodologies; effected new curriculum development in Computer Science and Engineering; or contributed to ACM's educational mission.*

- **Yoav Shoham and Moshe Tennenholtz**, recipients of the [ACM/AAAI Allen Newell Award](#) for contributions to multiagent systems spanning computer science, game theory, and economics. Shoham's pioneering work provided a methodology for specifying distributed multiagent systems. His research on game theory includes advances in combinatorial auctions, where participants place bids on combinations of discrete items. He also advanced mechanism design, sometimes known as reverse game theory, which sets formal rules that design a game as well as predicting how a game will be played. Shoham, professor of Computer Science at Stanford University, is a former director of Stanford's Artificial Intelligence Laboratory (SAIL), co-author (with Kevin Leyton-Brown) of *[Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations](#)*, a widely-praised textbook on multiagent systems, and the founder of several e-commerce software companies.

  Tennenholtz pioneered several approaches to the design and analysis of interactions between decision-makers in computational settings. He also created RMax, a general efficient algorithm applicable to learning by interacting with an environment. In addition, he introduced the concept of program equilibrium, an ingenious application of computer science to the analysis of Internet economies. He is acknowledged as a central contributor to many of Microsoft's pricing algorithms for online advertising. He holds the Sondheimer Chair at the Technion - Israel Institute of Technology, and is a principal researcher at Microsoft Research Israel. *The Newell Award recognizes career contributions that have breadth within computer science, or that bridge computer science and other disciplines.*

- **LLVM**, recipient of the [Software System Award](#). LLVM is a language-independent collection of programming technologies that enables code analysis and transformation for arbitrary programming languages. A collection of compiler technologies that turn programming languages into machine code used by processors, LLVM is widely used in commercial products as well as computer science research. Key factors in its success are the openness of its technology and the quality of its architecture and engineering as well as its clean, flexible design and easy-to-use programming interfaces. The LLVM project started in 2000 at the University of Illinois at Urbana-Champaign (UIUC) under the direction of Chris Lattner (now director of Developer Tools at Apple) and Vikram Adve, a professor at UIUC. Evan Cheng drove the design and implementation of the code generator in LLVM, and is now a senior manager at Apple. In the years since its release, LLVM has been incorporated into commercial products by Apple, Adobe, AMD, Arxan, AutoESL, Cray, Google, Intel, and many others. *The*

Software System Award is given to an institution or individuals recognized for developing software systems that have had a lasting influence, reflected in contributions to concepts and/or commercial acceptance.

- **Thomas Bartoschek and Johannes Schöning,** recipients of the [Eugene L. Lawler Award for Humanitarian Contributions within Computer Science and Informatics](#) for contributions to "Geoinformatics at School" (GI@School). This program empowers students to design solutions to problems in their communities by bringing geographic information together with computing and human interaction technologies. Bartoschek, the initiative's founder, and Schöning, a computer-human interaction expert, introduced high-end technology into the classrooms of countries around the world to encourage young people to make a difference in solving problems that matter. The project has established teacher workshops and a network of schools, teachers, and students that partner with public authorities and industry on projects like the use of GPS devices to map neighborhoods; inventories of local rooftops and their potential for solar energy development; collecting environmental data with DIY (do-it-yourself) sensors and microcontrollers or by developing smartphone applications.   Bartoschek, a research associate and Ph.D. student, leads the GI@School Lab at the Institute for Geoinformatics (IFGI) of the University of Münster in Germany. Schöning is a professor of Computer Science at Hasselt University in Belgium, and a former student at IFGI. *The Lawler Award recognizes an individual or group who has made a significant contribution through the use of computing technology*.

About the Awards

Grace Murray Hopper Award is given to the outstanding young computer professional of the year, selected on the basis of a single recent major technical or service contribution. This award is accompanied by a prize of $35,000. The candidate must have been 35 years of age or less at the time the qualifying contribution was made. Financial support for this award is provided by [Google, Inc.](#)

Paris Kanellakis Theory and Practice Award honors specific theoretical accomplishments that have had a significant and demonstrable effect on the practice of computing. This award is accompanied by a prize of $10,000 and is endowed by contributions from the Kanellakis family, with additional financial support provided by ACM's Special Interest Groups on Algorithms and Computation Theory (SIGACT), Design Automation (SIGDA), Management of Data (SIGMOD), and Programming Languages (SIGPLAN), the ACM SIG Projects Fund, and individual contributions.

Karl V. Karlstom Outstanding Educator Award is presented annually to an outstanding educator who is appointed to a recognized educational baccalaureate institution. The recipient is recognized for advancing new teaching methodologies; effecting new curriculum development or expansion in Computer Science and Engineering; or making a significant contribution to the educational mission of ACM. Those with ten years or less teaching experience are given special consideration. A prize of $5,000 is supplied by [Pearson Education](#).

ACM/AAAI Allen Newell Award is presented to an individual selected for career contributions that have breadth within computer science, or that bridge computer science and other disciplines. This endowed award is accompanied by a prize of $10,000, and is supported by the [Association for the Advancement of Artificial Intelligence](#), and by individual contributions.

Software System Award honors an institution or individual(s) recognized for developing a software system that has had a lasting influence, reflected in contributions to concepts, in commercial acceptance, or both. This award carries a prize of $35,000. Financial support for the award is provided by [IBM](#).

Eugene L. Lawler Award for Humanitarian Contributions within Computer Science and Informatics recognizes individuals or groups who have made a significant contribution through the use of computing technology. It is given every two years, assuming there are worthy recipients. The award is $5,000 plus travel expenses to the Awards banquet.

About ACM

ACM, the Association for Computing Machinery **www.acm.org,** is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.