



Association for
Computing Machinery

Advancing Computing as a Science & Profession

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ACM RECOGNIZES MAJOR TECHNICAL CONTRIBUTIONS THAT HAVE ADVANCED THE COMPUTING FIELD

2015 Recipients Made Contributions in Areas Including Artificial Intelligence, Software Systems and Encryption

NEW YORK, NY, April 27, 2016 – ACM, the Association for Computing Machinery (www.acm.org), today announced the recipients of four prestigious technical awards. These innovators were selected by their peers for making significant contributions that enable the computing field to solve real-world challenges. The awards reflect achievements in cryptography, network coding systems, computer-human interaction, and software systems. The 2015 recipients will be formally honored at the ACM Awards Banquet on June 11 in San Francisco.

The 2015 Award Winners Include:

- **Richard Stallman**, recipient of the ACM Software System Award for the development and leadership of GCC (GNU Compiler Collection), which has enabled extensive software and hardware innovation, and has been a lynchpin of the free software movement. A compiler is a computer program that takes the source code of another program and translates it into machine code that a computer can run directly. GCC compiles code in various programming languages, including Ada, C, C++, Cobol, Java, and FORTRAN. It produces machine code for many kinds of computers, and can run on Unix and GNU/Linux systems as well as others.

GCC was developed for the GNU operating system, which includes thousands of programs from various projects, including applications, libraries, tools such as GCC, and even games. Most importantly, the GNU system is entirely *free* (libre) software, which means users are free to run all these programs, to study and change their source code, and to redistribute copies with or without changes. GNU is usually used with the kernel, Linux. Stallman has previously been recognized with ACM's Grace Murray Hopper Award.

The ACM Software System Award is presented to 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. The Software System Award carries a prize of \$35,000. Financial support for the Software System Award is provided by IBM.

- **Brent Waters**, recipient of the Grace Murray Hopper Award for the introduction and development of the concepts of attribute-based encryption and functional encryption. Waters' innovations enhance security efforts at a time when greater volumes of highly confidential data are moving to the cloud. Traditionally, public-key encryption makes use of a public key that targets ciphertexts to a specific user that holds one

secret key. Waters' introduction of attribute-based encryption presented a new design where an administrator can create a policy-specific decryption key that will enable decryption of only the underlying files that satisfy the policy. Functional encryption, as conceived by Waters, takes things further by allowing an administrator to create private keys that allow a decryptor to learn only a particular function of the encrypted data, thus limiting their view to what they need to know about the data. Waters is an associate professor at the University of Texas at Austin. He has been named a Sloan Fellow, a Packard Fellow and a Microsoft Faculty Fellow. His many additional honors include receiving the Presidential Early Career Award for Scientists and Engineers.

The 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 Microsoft.

- **Michael Luby**, recipient of the Paris Kanellakis Theory and Practice Award for groundbreaking contributions to erasure correcting codes, which are essential for improving the quality of video transmission over the Internet. An important aspect of coding theory is to ensure that it is possible to recover data at a receiver transmitted from a sender, despite the fact that errors, often occurring naturally from “noise” on a channel, can impair the transmission. In coding theory, Luby made several theoretical contributions—including, but not limited to, Tornado Codes, Fountain Codes, and LT Codes—that have led to major advances in the reliable transmission and recoverability of data across mobile, broadcast and satellite channels. His work on erasure correcting codes has had an especially significant impact on the ability to stream videos, including mobile broadcast TV channels. Luby's contributions have been applied to military technology as well as consumer devices in both wired and wireless networks. Luby is a vice president of technology at Qualcomm Technologies, Inc., a subsidiary of Qualcomm Incorporated, and an ACM Fellow.

The 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.

- **Eric Horvitz**, recipient of the ACM - AAAI Allen Newell Award for contributions to artificial intelligence and human-computer interaction spanning the computing and decision sciences through developing principles and models of sensing, reflection, and rational action. His contributions have advanced the understanding of how computing systems can reflect about their own reasoning and about the goals and cognition of people. He showed how these methods can enable people and machines to work closely together as coordinated teams to solve problems, taking advantage of the complementarities of human and machine intelligence. Horvitz has played a leadership role in the development and fielding of practical applications including intelligent cloud services that make predictions about road traffic patterns and provide ideal route directions; computational models that assist physicians with decisions about such outcomes as readmissions and infections; methods that allocate resources within operating

systems; and techniques for prioritizing, filtering, and interpreting email. Horvitz is a technical fellow at Microsoft Research and a past president of the Association for the Advancement of Artificial Intelligence (AAAI). He is a fellow of ACM, AAAI, and the National Academy of Engineering (NAE).

The 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. The Newell award is accompanied by a prize of \$10,000, provided by ACM and the Association for the Advancement of Artificial Intelligence (AAAI), and by individual contributions.

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.

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