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ACM AND IEEE COMPUTER SOCIETY HONOR PIONEER OF HIGH PERFORMANCE COMPUTER MEMORY SYSTEMS

James Goodman Achieved Breakthroughs in Architecture of Shared-Memory Multiprocessors

NEW YORK, MAY 22, 2013 -- ACM (the Association for Computing Machinery) and IEEE Computer Society will jointly present the Eckert-Mauchly Award to James R. Goodman for contributions to the hardware/software interface of computer architecture. His innovations led to the development of hybrid approaches to high-performance computer memory systems that can achieve nearly the performance of hardware but with the flexibility of software. Goodman spent much of his career at the University of Wisconsin-Madison, where he and his students extensively researched computer memory systems. He is currently a computer science professor at the University of Auckland, New Zealand. The Eckert-Mauchly award is known as the computer architecture community's most prestigious award. Goodman will receive the 2013 Eckert-Mauchly Award http://awards.acm.org/eckert_mauchly, www.computer.org/portal/web/awards/eckert at the International Symposium on Computer Architecture (ISCA 2013) <http://isca2013.eew.technion.ac.il/>, June 26, in Tel Aviv, Israel.

In his seminal 1983 paper, *Using Cache Memory to Reduce Processor-memory Traffic*, Goodman was the first to describe what came to be known as snooping cache coherence protocols for maintaining the consistency of stored data in multiprocessing environments. The paper also identified the cache's importance in conserving memory bandwidth. This work is reflected in virtually every computer built and sold today, reflecting the broad influence of his innovations.

Goodman was the principal co-inventor of hardware queue-based locks, which allow programs with busy-wait synchronization, also known as spinning, to scale to very large multiprocessors. Spinning is a technique in which a process repeatedly checks to see if a condition is true. He also introduced critical section speculation, which helped launch the resurgence of transactional memory as a parallel programming and synchronization method. Transactional memory is used for controlling access to shared memory in concurrent computing, a computational processes that may be executed in parallel. Architectures based on this work have recently begun to appear in products, including the flagship microprocessors from Intel Corp.

Goodman co-authored *A Programmer's View of Computer Architecture*, a highly acclaimed book on computer architecture, with Karen Miller, and *Structural Computer Architecture* with Andrew Tanenbaum. A principal supervisor of 10 Ph.D. students, several of which have received prominent recognition as academics and practitioners, Goodman is a Fellow of IEEE and ACM.

A graduate of the University of California, Berkeley with a Ph.D. degree, he worked for Intel Corp. while earning his degree. He then joined the faculty at the University of Wisconsin – Madison and spent several academic years on sabbatical at AT&T Bell Laboratories, the Advanced Computer Research Laboratory in Lyon, France, and Intel Corp. before going to the University of Auckland.

ACM and IEEE Computer Society co-sponsor the Eckert-Mauchly Award, which was initiated in 1979. It recognizes contributions to computer and digital systems architecture and comes with a \$5,000 prize. The award was named for John Presper Eckert and John William Mauchly, who collaborated on the design and construction of the Electronic Numerical Integrator and Computer (ENIAC), the pioneering large-scale electronic computing machine, which was completed in 1947.

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.

About IEEE Computer Society

IEEE Computer Society, www.computer.org, is one of the world's leading computing membership organizations and a trusted information and career-development source for a global workforce of technology leaders including: professors, researchers, software engineers, IT professionals, employers, and students. IEEE Computer Society provides high-quality, state-of-the-art information on an on-demand basis. The Computer Society provides a wide range of forums for top minds to come together, including technical conferences, publications, a comprehensive digital library, unique training webinars, and professional training. IEEE is the world's largest professional association for advancement of technology and the Computer Society is the largest society within IEEE.

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