



**Association for
Computing Machinery**

Advancing Computing as a Science & Profession

Contacts:

Virginia Gold
ACM
212-626-0505
vgold@acm.org

Pam Kemper
IEEE Computer Society
202-371-0101 x 4009
pkemper@computer.org

**ACM, IEEE-CS HONOR PROCESSOR ARCHITECT WHO BRIDGED INDUSTRY-ACADEMIC
DIVIDE**

Joel Emer Pioneered Quantitative Approach to Processor Performance Evaluation

New York, April 14, 2009 -- The Association for Computing Machinery (ACM) and the IEEE Computer Society (IEEE-CS) will jointly present the ACM-IEEE CS Eckert-Mauchly Award to Dr. Joel Emer of Intel Corp. for pioneering contributions to performance analysis, modeling methodologies, and design innovations in several significant industry microprocessors. Emer developed quantitative methods including measurement of real machines, analytical modeling, and simulation techniques that are now widely employed to evaluate the performance of complex computer processors. He was also cited for his ability to bridge the gaps that often mark research and development as well as academia and industry. He will receive the 2009 [Eckert-Mauchly Award](#), known as the most prestigious award in the computer architecture community, at the [International Symposium on Computer Architecture](#), June 20-24, in Austin, TX.

Emer contributed original analysis and novel architecture research for various VAX and Alpha processors developed by Digital Equipment Corporation (DEC) and Compaq Computer Corporation. These instruction set architectures were the preeminent super-minicomputer and microprocessor architectures of their time. Emer's groundbreaking approach to performance modeling and evaluation techniques led to higher quality and more applicable research results, and his architectural contributions helped maintain the Alpha processors as the fastest microprocessors of their era.

As an industry researcher, Emer collaborated with university researchers on pioneering work on simultaneous multithreading, a technique for using a single instance of processor hardware to execute multiple programs simultaneously. These concepts have been used in several major industry processors including the Intel Pentium 4 processor and the Intel Core i7 processor.

Over his career, Emer has made other significant contributions in areas ranging from pipeline organization and vector processing to caches and prediction. Recently, he has contributed techniques for analyzing the architectural impact of soft errors that have been widely applied by architecture researchers to accurately access the benefits of their ideas for mitigating faults due to cosmic rays and Alpha radiation.

Emer is an Intel Fellow and Director of Microarchitecture Research at Intel Corp. Since 2005, he has also been a visiting faculty member at MIT. Before joining Intel in 2001, he was a Compaq Fellow and Director of Alpha Architecture Research, where he led research efforts for future processors for Compaq's 64-bit family of servers. He spent 22 years at Digital/Compaq, where he worked on processor architecture, performance analysis, and performance modeling methodologies, and served on the task force that proposed DEC's Alpha processor strategy.

In 2004, Emer was named an [ACM Fellow](#) and an [IEEE Fellow](#) for contributions to computer architecture and quantitative processor performance analysis. He holds 25 patents and has published more than 35 papers. He received both a BS degree with highest honors in electrical engineering, and an MS degree in electrical engineering from Purdue University. He earned a Ph.D. in electrical engineering from the University of Illinois under the 2000 Eckert-Mauchly Award recipient Edward Davidson.

ACM and IEEE-CS co-sponsor the Eckert-Mauchly Award, which was initiated in 1979, and is given for contributions to computer and digital systems architecture. It was named for John Presper Eckert and John William Mauchly, who collaborated on the design and construction of the first large scale electronic computing machine, known as ENIAC—the Electronic Numerical Integrator and Computer, completed in 1947. It comes with a \$5,000 prize.

About ACM

ACM, the Association for Computing Machinery www.acm.org, unites 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 the IEEE Computer Society

The IEEE Computer Society www.computer.org, the largest society of the Institute of Electrical and Electronics Engineers (IEEE), is dedicated to advancing the theory, practice, and application of computer and information-processing technology. The IEEE-CS serves the information and career-development needs of today's computing researchers and practitioners with [technical journals](#), [magazines](#), [conferences](#), [books](#), [conference publications](#), and [online courses](#). Known worldwide for its computer-standards activities, the IEEE-CS promotes an active exchange of ideas and technological innovation among its members.

###