NEWS RELEASE

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Stanford University Professor Receives the ACM - IEEECS Eckert-Mauchly Award for Contributions to Microprocessor Memory Systems

Mark Horowitz was the First to Identify the Processor-Dynamic Random Access Memory (DRAM) Interface

New York, NY, June 16, 2022 – ACM, the Association for Computing Machinery, today announced that Mark Horowitz**,** a Professor at Stanford University, is the recipient of the ACM - IEEE CS Eckert-Mauchly Award for contributions to microprocessor memory systems.

Horowitz was the first to identify the processor to dynamic random-access memory (DRAM) interface as a key bottleneck that required architecture and circuit optimization. He pioneered high-bandwidth DRAM interfaces. In addition, modern DRAM interfaces such as SDDR and LPDDR were strongly influenced by his techniques.

In the 1990s, Horowitz was also a major contributor to the DASH and FLASH projects, which explored scalable methods for implementing cache coherency using directories rather than snooping protocols. Today almost all cache-coherent multiprocessors rely on such directory mechanisms either within or across multicores.

His deep insights at the intersection of architecture and circuits have profoundly influenced the field. He demonstrated the growing importance of wire delay in systems with large memories through his landmark paper, “The Future of Wires” in 2001. Horowitz has led research that recognizes that future performance/energy progress after the end of Dennard scaling will require greater use of hardware accelerators. He also pioneered work in Smart Memories, an early work customizing memory as well as processors; many of today’s domain-specific architectures build on this concept.

Horowitz is the Yahoo! Founders Professor in the School of Engineering and Professor of Computer Science at Stanford University. His current interests include applying electrical engineering and computer science analysis methods to problems in neuro and molecular biology as well as creating new agile design methodologies for analog and digital VLSI circuits. Horowitz also co-founded the company Rambus, Inc., which designs high-bandwidth memory interface technology. Horowitz holds BS and MS

degrees from the Massachusetts Institute of Technology (MIT) and a PhD from Stanford University. Horowitz is a Fellow of ACM, IEEE, and the American Academy of Arts and Sciences, and he is a Member of the National Academy of Engineering.

About the Eckert-Mauchly Award

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 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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