CEDA

IEEE Council on Electronic Design Automation

CEDA Remembers Edward J. McCluskey

IEEE CEDA sponsored a luncheon on 7 June 2016 at the Design Automation Conference (DAC) in honor of Edward J. McCluskey (1929-2016). McCluskey passed away earlier this year at the age of 86.

The luncheon featured tributes from Bill Joyner (Semiconductor Research Corp.), Tom Williams (Synopsys Fellow), and Daniel P. Siewiorek (Carnegie Mellon University). There was also a distinguished lecture by Arvind Krishna (IBM Research) about the new challenges that the EDA Community will need to address in the future era of Internet-of-Things and Big Data. The luncheon had many attendees. Many people in the EDA community wanted to thank Ed for his huge role in this community.

Edward McCluskey, professor emeritus of electrical engineering and computer science at Sanford University, was a giant who shaped the design and testing of digital systems for more than half a century. He sustained a relentless pace of fundamental contributions for efficient and robust design, high-quality testing, and reliable operation of digital systems. He was also a pioneer in establishing and fostering computer engineering as a profession. He received numerous awards and honors.

"Prof. McCluskey was the father of modern digital design," said Arvind Krishna. "His seminal contributions to switching theory, logic design, testing, and fault-tolerant computing laid the foundation for the computer processors that power so much of our world today."

As a doctoral student, McCluskey created the Quine-McCluskey logic minimization procedure, which marked the beginning of EDA. Over the past 60 years, this method has been used in numerous EDA tools, and is still used today. His work on hazards in logic circuits and fundamental-mode sequential circuits are classics.

When McCluskey entered the digital-testing field in the late 1960s, it was considered by many to be lacking in solid technical foundations. However, his deep insights transformed the way testing was practiced in industry and researched in academia. McCluskey was on the forefront of exploring novel approaches, rooted in mathematical principles, for blending test into digital-system design.

McCluskey and his students developed many key concepts in fault-tolerant computing. His fault tolerance and testing concepts are essential for safety in future applications such as self-driving cars.

McCluskey was also one of the world's leading educators. His textbooks on logic design defined the discipline. The computer engineering field and the IEEE Computer Society owe a major part of their current status to Edward McCluskey. He was the first president of the IEEE Computer Society. At Princeton University, he established the computer engineering curriculum, and he founded the university computer center in the early 1960s. At Stanford University, he founded the Digital Systems Lab (renamed the Computer Systems Lab), which uniquely cultivated collaboration between electrical engineering and computer science.

"Ed McCluskey was a pioneer in the computer engineering community," stated Stanford President John Hennessy. "In addition to shaping the development of digital systems, he was a great educator, producing an incredible group of PhD graduates, many of whom have gone on to become industry leaders."

He also founded the Center for Reliable Computing (CRC) at Stanford University. The CRC has played a major role in advancing the fields of computer reliability and testing, from ad hoc pursuits to frontline academic and industry research.

Synopsys Chairman Aart De Geus stated: "As a young student learning about Ed's work, all the way to today appreciating his contributions in making the 'digital revolution' not

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a slogan but a world-changing reality, we realize the impact of Ed's contribution on our field and our own destiny."

Anyone wishing to share thoughts or memories about Ed McCluskey may send them to ejm.memorial@gmail.com.

Giovanni De Micheli Wins EDAA Lifetime Achievement Award

The EDAA Lifetime Achievement Award is given to individuals who have made outstanding contributions to the state of the art in electronic design, automation, and testing of electronic systems during their career. To be eligible, candidates must have made innovative contributions that have made an impact on the way electronic systems are being designed.

The winner of the 2016 EDAA Lifetime Achievement Award is Giovanni De Micheli. The award was presented to De Micheli at the plenary session of the Design, Automation and Test in Europe Conference (DATE) on 15 March 2016, in Dresden, Germany.

Giovanni De Micheli has been a worldwide research leader in the domain of EDA, particularly in the synthesis of digital circuits. He has made seminal contributions to modeling languages, and high-level and logic synthesis. He has also contributed to the foundation of computer-aided hardware-software codesign as a discipline. He is a leader in design algorithms and tools for low-power electronic design.

De Micheli is one of the founding fathers of network-on-chip (NoC) technology, a rapidly expanding area of R&D worldwide. He currently serves as the director of the Institute of Electrical Engineering and the head of the Laboratory of Integrated Systems at EPFL Switzerland. His research focuses on design automation for systems on chips (SoCs), including electrical, mechanical, and biological subsystems.

Papers in IEEE Embedded Systems Letters

The top-five accessed articles from *IEEE Embedded Systems Letters* in May 2016 were as follows:

- "Motion Noise Cancelation in Heartbeat Sensing Using Accelerometer and Adaptive Filter," by S. Ardalan, S. Moghadami, and S. Jaafari.
- "Wearable Camera- and Accelerometer-Based Fall Detection on Portable Devices," by K. Ozcan and S. Velipasalar
- "Energy Efficient Outdoor Light Monitoring and Control Architecture Using Embedded System," by Z. Kaleem, T.M. Yoon, and C. Lee
- "Bringing Hardware Multithreading to the Real-Time Domain," by T. Gomes et al.
- "A Compact Portable Microwave Life-Detection Device for Finding Survivors," by F. JalaliBidgoli, S. Moghadami, and S. Ardalan

Upcoming Conferences (Yao-Wen Chang, yaowenchang@ieee-ceda.com)	
ICCAD	Austin, Texas, 7-10 November 2016
ASP-DAC	Tokyo, Japan, 16-19 January 2016
DATE	Lausanne, Switzerland, 27-31 March 2016

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IEEE Design & Test is open for submissions. Visit mc.manuscriptcentral.com/dandt and ieee-ceda.org/publications/d-t/paper-submission.