Citation

For pioneering researches in computer architecture, especially RISC processors, as well as outstanding contribution to and leadership in higher education.

Dr. John L. Hennessy

Positions and Organizations :

President Emeritus, Stanford University

Director, Knight-Hennessy Scholars Program, Stanford University

Professor of Electrical Engineering and Computer Science, Stanford University

Degree : Ph.D. (State University of New York, Stony Brook, 1977)

Date of Birth : September 22, 1952

Brief Biography :

1973　B.E. Electrical Engineering, Villanova University

1975　M.S. Computer Science, S.U.N.Y., Stony Brook

1977　Ph.D. Computer Science, S.U.N.Y., Stony Brook

1977　Assistant Professor of Electrical Engineering, Stanford University

1983　Associate Professor of Electrical Engineering, Stanford University

　　　Director of Computer System Laboratory, Stanford University

1984　Cofounder & Chief Scientist, MIPS Computer Systems (now part of Imagination Technologies)

1986　Professor of Electrical Engineering and Computer Science, Stanford University

1987　Willard and Inez Kerr Bell Endowed Professor, Stanford University

1992　Chief Architect, Silicon Graphics Computer Systems

1994　Chairman, Department of Computer Science, Stanford University

1996　Dean, School of Engineering, Stanford University

1999　Provost, Stanford University

2000　President, Stanford University

2016　Shriram Family Director, Knight-Hennessy Scholars Program, Stanford University

Main Awards and Honors:

1994　IEEE Emanuel R. Piore Award

2000　IEEE John Von Neumann Medal (jointly with D. Patterson)

2000　Benjamin Garver Lamme Award, American Society for Engineering Education

2001　Seymour Cray Computer Engineering Award

2001　Eckert-Mauchly Award, ACM and IEEE Computer Society

2004　C&C Prize (jointly with D. Patterson)

2005　Founders Award, American Academy of Arts and Sciences

2007　Fellow, Computer History Museum

2012　IEEE Medal of Honor

2013　Carnegie Academic Leadership Award, Carnegie Foundation

2016　Frank E. Taplin Public Intellectual Award, Woodrow Wilson National Fellowship Foundation

Fellow of ACM, IEEE, and AAAS. Member of NAE, NAS and American Philosophical Society

Main Achievements :

He earned his bachelor's degree in electrical engineering from Villanova University, and his master's degree and Ph.D. in computer science from State University of New York, Stony Brook.

He joined Stanford's faculty in 1977 and focused on the research of RISC (Reduced Instruction Set Computer), which revolutionized the computer industry by increasing performance while reducing costs. RISC processors achieved higher speeds because they operated from a set of simpler computer instructions than earlier microprocessors. In 1981, he initiated the MIPS project at Stanford. MIPS is a high-performance RISC, built in VLSI. In addition to his role in the basic research, he played a key role in transferring this technology to industry. During a sabbatical leave from Stanford in 1984-85, he cofounded MIPS Computer Systems (later MIPS Technologies Inc. and now part of Imagination Technologies), which specializes in the production of chips based on these concepts. Several billion MIPS microprocessors have been shipped in devices ranging from video games and computers to network devices. The low power-consumption and heat characteristics of embedded MIPS implementations, the wide availability of embedded development tools, and knowledge about the architecture means use of MIPS microprocessors in embedded roles is likely to remain common.

He also led the Stanford DASH (Distributed Architecture for Shared Memory) multiprocessor project. DASH was the first scalable shared memory multiprocessor with hardware-supported cache coherence. More recently, he has been involved in FLASH (FLexible Architecture for Shared Memory), which is designed to support different communication and coherency approaches in large-scale shared-memory multiprocessors.

He co-authored, with David A. Patterson from UC Berkeley, two well-known books on computer architecture, *Computer Organization and Design: the Hardware/Software Interface* and *Computer Architecture: A Quantitative Approach*, which introduced the DLX RISC architecture. They have been widely used as textbooks for graduate and undergraduate courses since 1990.

He rose to full professorship in 1986 and became Willard and Inez Kerr Bell Endowed Professor of Electrical Engineering and Computer Science. He served as director of Stanford's Computer System Laboratory (1983-1993), chair of the Department of Computer Science (1994-96), dean of the School of Engineering (1996-99), provost (1999-2000), and president (2000-2016).

Among numerous honors, he received the IEEE Medal of Honor (2012), Eckert-Mauchly Award of the Association for Computing Machinery (2001), Seymour Cray Computer Engineering Award (2001), and IEEE John von Neumann Medal (2000). He was made a fellow of Computer History Museum in 2007. He is a fellow of IEEE, the American Academy of Arts and Sciences, the Association for Computing Machinery and is a member of the National Academy of Engineering and the National Academy of Sciences.

He is currently a director of the Knight-Hennessy Scholars Program, which annually admits 100 high-achieving students with demonstrated leadership and civic commitment. Upon admittance to this program, scholars from a wide range of backgrounds and nationalities will receive funding for three years to pursue master's or doctorate level degrees, or professional programs, along with leadership education and innovation and other curricula designed to develop their capacity to lead ambitious changes in a complex world.

For pioneering researches in computer architecture, especially RISC processors, as well as outstanding leadership and contribution to higher education, Dr. John L. Hennessey is hereby awarded the Okawa Prize.