

In Memoriam: Chittoor V. Ramamoorthy, PhD 1926-2016

Benjamin W. Wah, On Behalf of Friends, Colleagues, and Associates of Ramamoorthy

IT is with great sorrow that our journal announces the death of Professor Chittoor V. Ramamoorthy, who passed away peacefully on March 9, 2016 in San Diego, California. Prof. Ramamoorthy was a loving husband and father, brilliant teacher, and pioneering engineer. He was a kind, benevolent, and gentle soul. He was an incredible friend, teacher, and mentor to many people and a man of deep wisdom and insight. His exemplary life serves as a model for all of us. We mourn his passing and extend our heartfelt condolences to his family, friends, and associates. His legacy endures as he continues to serve as a role model for our community. The mark he made upon this world will long be remembered.

Dr. Ramamoorthy was a true pioneer of the disciplines of software engineering, knowledge engineering, data engineering, distributed and parallel computation, and computer architecture, making important contributions to all of these areas.

He was born in May 1926 in Burma, and was educated in India and the USA. He held six earned degrees: two undergraduate degrees, one in physics and one in textile technology from the University of Madras, India; two graduate degrees in mechanical engineering from the University of California, Berkeley; and two graduate degrees from Harvard University, including one in applied mathematics and a PhD in electrical engineering and computer science, which he received in 1964.

While at Harvard, he worked with Honeywell's Computer Division in Waltham, MA, from 1956 to 1967, where he later became a senior staff scientist. During this time, he designed read/write heads for tape drives, worked on the first Honeywell digital inertial guidance system, and later was among the three engineers working under Dr. Joseph Eachus—who collaborated with Alan Turing on the machine that cracked the German Enigma ciphers during World War II.

Following his tenure at Honeywell, he joined The University of Texas at Austin as a professor of electrical engineering. He went on to become the chair of the Computer Science Department, the third person to hold that position. He later moved to the University of California, Berkeley, as a professor of electrical engineering and computer science, from which he retired as Professor Emeritus. Over his prolific career, he supervised 73 PhD students, serving as both advisor and mentor. His generous and exemplary mentorship is reflected in the fact that his students include a Vice Chancellor, three University Presidents, and a President of



Chittoor V. Ramamoorthy, 1926 - 2016.
(Photo provided by courtesy of SDPS)

the IEEE Computer Society, as well as several Deans, Department Chairs, Chair Professors, and CEOs.

Prof. Ramamoorthy's research accomplishments span several important areas of computer science, including the synthesis of parallel programs, optimal organization and scheduling of parallel programs, recovery and rollback techniques for enhancing the dependability of distributed systems, automated simulation and testing of safety-critical systems, and other innovative research projects. His research contributions have had significant impact on enhancing the dependability of safety-critical distributed real-time embedded systems. For example, in the late 1960's, he and his students developed an automated test generation and evaluation system that discovered several programming errors in the US Army's Safeguard Missile Defense System. Updated versions of these tools were used in 1971 at NASA's Space Shuttle Structural Test Facility in Huntsville, AL, for rigorously testing the Space Shuttle System.

Earlier, he was responsible for the development of the entire microcode for instruction sequencing and control of the first transistorized system of Honeywell, the H-290, in 1961. The H-290 was a general purpose, stored-program digital computer designed for process monitoring and control. Later, he conducted research on functions, features, and control in the service industries and showed the close and enduring relationships between software engineering and service engineering. He published more than 200 papers and coedited three books: *The Handbook on Software Engineering*, *Pacific Computer Communications*,

For information on obtaining reprints of this article, please send e-mail to: reprints@ieee.org, and reference the Digital Object Identifier below.
Digital Object Identifier no. 10.1109/TKDE.2016.2553938

and *Computers for AI Processing*. Throughout his career, he was an exemplary transdisciplinary innovator who was always at the cross-sections to invent the future.

Prof. Ramamoorthy was very active in the IEEE and the computing community throughout his career. He was named a life fellow of the IEEE. In addition, he was elected First Vice President of the IEEE Computer Society, and served as the Society's very first Vice President of Education as well as the Education Chair of the American Federation of Information Processing Societies (AFIPS). He served as the Founding Editor-in-Chief of this very journal and served as the Editor-in-Chief of the *IEEE Transactions on Software Engineering*. He was the Editor-in-Chief of the *International Journal of Software Engineering and Artificial Intelligence*, and a founding co-Editor-in-Chief of the *International Journal of Systems Integration* and the *Journal of the Society of Design and Process Science*. He was also involved in numerous conferences: he served as the co-General Chair of the Second International Conference on Software Engineering (ICSE) in 1976 and cofounded the IEEE Symposium on Reliable Distributed Systems (SRDS) in 1981 and the IEEE International Conference on Data Engineering (ICDE) in 1985. In addition, he served on many advisory committees, including those of the US Army, Air Force, and Navy, Los Alamos Labs, Lockheed Research, and IBM.

He received many awards from the IEEE and the IEEE Computer Society: the IEEE Golden Core Recognition Award in 1966; the IEEE Computer Society Honor Roll Award in 1974; the IEEE Computer Society Special Education Award in 1978; the Group Award in Education for Curriculum Development; the IEEE Computer Society Taylor Booth Award in 1990 for outstanding contributions to education; and the Richard E. Merwin Distinguished Service Award in 1993 for outstanding professional contributions. He was among the select few of the IEEE's large membership to receive both the IEEE Centennial Medal in 1984, which marked the first 100 years of this organization, and the IEEE Third Millennium Medal in 2000. In 2001, he was awarded the IEEE Computer Society's Hitachi-Kanai Award for fundamental contributions in parallel and distributed computing.

He also received numerous other awards in the computing community at large. These include the Control Data Distinguished Professorship at the University of Minnesota, MN; Grace Hopper Chair at the US Naval Postgraduate School in Monterey, CA; Senior Research Fellow at the ICC Institute of the University of Texas, Austin, TX; Academy Gold Medal of Honor Award from the Academy of Transdisciplinary Learning and Advanced Studies (ATLAS) in 2002; and a fellow of ATLAS and fellow of the Society for Design and Process Science (SDPS).

He received several SDPS awards beginning with the Distinguished Scholar Award in 1995; the Raymond T. Yeh Distinguished Achievement Award in 2002; followed by the Herbert Simon Award in 2006. In 2006, SDPS established the Ramamoorthy-Yeh Endowment, named after Prof. Ramamoorthy and his close associate and lifelong friend Prof. Raymond T. Yeh, in honor of their accomplishments as scientist-engineers. In 2010, SDPS presented Prof. Ramamoorthy with its highest award, the SES Transformative Achievement Award, for his

outstanding contributions in software engineering. In 2014, he was included in the distinguished list of eight SDPS Visionaries whose far-reaching work and ideas inspired the formation of SDPS.

Behind Prof. Ramamoorthy's calm and humble demeanor lay both remarkable intellect as well as strength of character, exemplified by his unwavering devotion to ethics. He valued fairness and friendship. He loved to laugh and celebrate life, and traveled extensively throughout his life.

He led by example, and was truly admired and respected by his many friends, colleagues, and associates across the world. We will miss our beloved "Prof. Ram." May he always be remembered fondly by those who had the great fortune of knowing him, and may he continue to serve as an inspiration and role model for future generations of scientists and engineers.

▷ **For more information on this or any other computing topic, please visit our Digital Library at www.computer.org/publications/dlib.**