V. V. S. Sarma (1944–2018)

Professor Vallury Visweswara Subrahmanya Sarma, an extraordinary teacher and researcher, passed away on 13 January 2018 at his home in Bengaluru.

Sarma was born on 7 May 1944 in Vijayawada. After graduation with a University gold medal in mathematics, physics and chemistry (MPC) from Andhra University in 1961, he obtained his B E, M E and Ph D degrees from Indian Institute of Science (IISc), Bengaluru. He served IISc as faculty in various capacities from 1967. He became a full professor in 1983, and continued service until his retirement in 2006. He was a visiting professor at the University of Southwestern Louisiana, USA between 1984 and 1986 and at the Tata Research Development and Design Centre, Pune between 1995 and 1997. He was elected to the fellowships of the Indian Academy of Sciences (Bengaluru), Indian National Science Academy (New Delhi) and Indian National Academy of Engineering (New Delhi). Post-retirement, he was an Honorary Professor in Computer Science Automation (CSA) and an INAE Distinguished Professor.

Sarma, fondly called VVS by his students and friends, spent most of his academic career at IISc. Over nearly four decades, he had initiated research at IISc in the then emerging areas of reliability engineering, pattern recognition, artificial intelligence (AI) and machine learning, which are of utmost importance in the industry today. His survey paper in a special issue on AI in management with some new material in *IEEE Transactions on Knowledge and Data Engineering*[1] has been widely cited. He guided a generation of researchers in these areas. His students were drawn from CSA, ECE, Aerospace, Mathematics and Metallurgy departments at IISc and engineers from organizations such as IAF, NAL, ISRO, DRDO, BHEL, etc. under the external registration programme. Many of his students are currently senior professors in universities or senior engineering researchers in organizations (like DRDO and ISRO) across India, USA and Canada. Along with his colleagues, Sarma wrote a book entitled *Reliability of Computer and Control Systems*[2]. He also jointly co-edited a book entitled *Artificial Intelligence and Expert Systems in Indian Context*[3].

Sarma was closely associated with defence-related research work in India, supported by several defence laboratories and DRDO. His interdisciplinary research interests span several areas like control systems, reliability and maintainability, pattern recognition, artificial intelligence and aerospace systems. A few of his significant contributions are highlighted below.

An intelligent agent-based guidance system component which he developed, is being used by DRDL, Hyderabad for the AKASH missile. He developed the simulation system for naval battles, including an airborne surveillance platform such as HTAS, and shore-based missile batteries using Petri net models. Another area of his contribution is the pattern recognition systems. Multi-sensor data fusion, with data collected from various command centres in order to get a united battlefield scenario, is an important application. Sarma provided significant methodologies to the Centre for Artificial Intelligence and Robotics at DRDO since its inception. Before his demise he was overseeing an important project titled 'Artificial intelligence technologies for network centric operations', which was essential for solving defence logistics problems. He also developed expert systems for using remote sensing data in land-use analysis and defence applications.

Sarma was an inspiring teacher. He used to enthuse and motivate his students to learn many topics of current research. As early as 1976, when the field was still in its infancy, he taught a course on AI at IISc. He was a very gentle person and used to be affectionate towards all his students.

During 2006–2012 Sarma served as Honorary Professor and INAE Distinguished Professor at IISc. He studied the interface between intelligent systems in engineering and Indian philosophy. He had great appreciation of the four Darsanas: Samkhya, Yoga, Nyaya, Vaiseshika and some familiarity with Mimamsa and Vedanta. He was exploring the connections between AI and smart systems on the one hand and the function of human mind in terms of thinking, memory, discrimination (viveka, ववेको), knowledge, ignorance (अववदया), consciousness, self, Atman and Brahman (as defined by satyam, jnanam anantam brahma, तिया जाना अननता बहम) on the other. Sarma believed that Indian philosophy has the potential for clarifying the scope of AI and its boundaries. He was an active researcher and writer during this period on various topics connecting engineering and Indian philosophy.

Sarma has researched, edited, translated and rearranged the books *Structure of the Universe (Vedic)*, *Sri Krishna* and *Hindu Vivaha Vyavastha* by Brahmasri K. Sivananda Murty, from Telugu to English. He was a regular contributor of articles in Telugu and English to Supatha, Narahari Vani and Chaitanyam.

In the passing away of Sarma the research community has lost a mentor, an influential researcher and an outstanding teacher and his students have lost a father figure. Sarma is survived by his wife and three daughters.

1. Noronha, S. J. and Sarma, V. V. S., *IEEE Trans. Knowl. Data Engg.*, 1991, **3**(2), 160–171.
2. Viswanadham, N., Sarma, V. V. S. and Singh, M. G., *Reliability of Computer and Control Systems*, North-Holland Systems and Control Series, Elsevier Science, New York, USA, 1987, vol. 8, p. 482.
3. Sarma, V. V. S., Viswanadham, N., Deekshatulu, B. L. and and Yeganarayan, B., *Artificial Intelligence and Expert Systems in Indian Context*, Tata-McGraw Hill, 1990.

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