

Keynote Address 2:

Intelligent Robotics—Misconceptions, Current Trends and Opportunities

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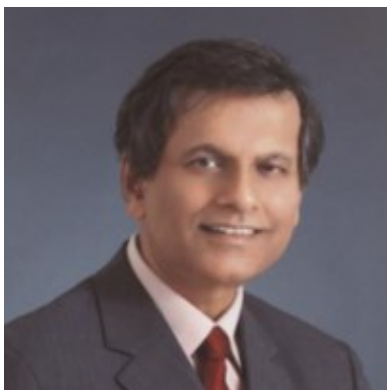
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Abstract:

The concepts of “Robots” have been of interest to humans from the historical times, initially with the desire to create “artificial slaves.” Since the technology was not developing to keep up with the “dreams,” initially Robotics was primarily of entertainment value, relegated to plays, movies, stories, and so on. The practical applications started in the late 1950s and the 1960s with the development of programmable devices for factories and assembly lines, as flexible automation. However, since the expectations were not adequately realized, the general enthusiasm and funding for Robotics subsided to some extent. With subsequent research, developments, and curricular enhancement in Engineering and Computer Science and with the resurgence of Artificial Intelligence (AI), particularly machine learning, Robotics has found numerous practical applications today, in industry, medicine, household, the service sector, and the general society. Important developments and practical strides are being made, particularly in Soft Robotics, Mobile Robotics (Aerial—drones, Under Water, Ground-based—autonomous vehicles in particular), Swarm Robotics, Homecare, Surgery, Assistive Devices, and Active Prosthesis.

This talk will start with a brief history of Robotics while indicating some associated myths and unfair expectations. Next it will outline key developments in the area. In particular, some important practical applications of Intelligent Robotics, as developed by groups worldwide including the Industrial Automation Laboratory at the University of British Columbia, headed by the author, will be indicated. Some misconceptions and shortcomings concerning Intelligent Robotics will be pointed out. The main shortcomings concern the mechanical capabilities and the nature of intelligence. The talk will conclude by mentioning future trends and key opportunities available in Intelligent Robotics, for both developed and developing countries.

Speaker Biography:



Clarence W. de Silva received his primary education at B/Morahela Maha Vidyalaya, under the loving care, coaching and guidance of his parents who were teachers. His mother in particular, with her remarkable foresight, self-learned English and Algebra and taught him those subjects even before Grade 5 even though those subjects were not taught in her village school. Subsequently he was sent to St Bede’s College, Badulla, St Thomas’ College, Gurutalawa, and finally Ananda College, Colombo from where he entered the then University of Ceylon (now University of Peradeniya) after winning the Dr. Erwin de Silva Gold

Medal. He graduated from the University obtaining First Class Honors and the Dr. C. H. Hewavitarana Prize in Engineering. After working several years at Arpico Factory in Nawinna, Maharagama (now defunct) as an Assistant Works Engineer, he went overseas. He obtained an MASc degree from University of Toronto, PhD degrees from MIT and University of Cambridge, and recently, the ScD degree, the so-called “Higher Doctorate,” from University of Cambridge. He is a Fellow of: IEEE, ASME, Canadian Academy of Engineering, and Royal Society of Canada. Also, he has been a Senior Canada Research Chair, NSERC-BC Packers Chair in Industrial Automation, Mobil Endowed Chair, Lilly Fellow, Senior Fulbright Fellow, Killam Fellow, Erskine Fellow, Professorial Fellow, Faculty Fellow, Distinguished Visiting Fellow of the Royal Academy of Engineering, UK, and a Peter Wall Scholar. He has authored 25 books and about 600 technical papers, approximately half of which are in journals. He has attempted to pay back to his motherland through such activities as: providing scholarships to two dozen Sri Lankan students for post-graduate studies in Canada; developing curricula and course material in Mechatronics and conducting courses for educational institutions in Sri Lanka, including the Open University; endowing an award for the top student in Mechatronics; and developing computer facilities, roads, mentoring network, health clinics, and hospital cafeteria in a rural area .