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Desineni Subbaram Naidu

University of Minnesota Duluth, USA

Fusion of hard and soft control strategies for a smart prosthetic/ robotic hand

There are now over 20 million people in the world with missing limbs resulting from combat and non-combat operations and by 2050 there will be 50 million amputees all over the world. The availability of artificial limbs will help these people to lead a better normal life. The overall goal of the research on Prosthetic Hand Technology is to develop a smart prosthetic hand using intelligent strategies for electromyographic (EMG) signal extraction, analysis, identification, kinematic synthesis, and embedded hierarchical real-time systems and control by fusion of soft computing and hard computing techniques. The fusion of soft and hard control synergetic strategy alleviates the present problems associated with prosthetic devices. The presentation is based on Professor Naidu's recent 3-D Printed Prosthetic Hand for the World and his new research book published in October 2017 by the IEEE Press - Wiley (Series on Systems Science and Engineering) titled, "Fusion of Hard and Soft Control Strategies for a Robotic Hand".

Speaker Biography

Desineni Subbaram Naidu received MTech & PhD in Electrical Engineering, from Indian Institute of Technology Kharagpur (IITK), INDIA. He taught, visited and/or conducted research at IIT; National Research Council (NRC) Senior Research Associate at Guidance and Control Division at NASA Langley Research Center, Hampton, VA, USA (1985-90); Old Domain University, Norfolk, VA, USA (1987-90); as Professor, Associate Dean and Director, School of Engineering at Idaho State University and Measurement and Control Engineering Research Center, Pocatello, Idaho, USA (1990-2014). Since August 2014, he has been with University of Minnesota Duluth as Minnesota Power Jack Rowe Endowed Chair and Professor of Electrical Engineering. Professor received twice the Senior National Research Council (NRC) Associateship award from the US National Academy of Sciences (NAS), and is an elected (1995) (now Life) Fellow of the Institute of Electrical and Electronic Engineers (IEEE) and an elected (2003) Fellow of the World Innovation Foundation, UK. His teaching and research interests are Electrical Engineering; Control Systems; Optimal Control: Theory and Applications; Biomedical Sciences and Engineering (Prosthetics and Infectious Diseases); Large Scale Systems and Singular Perturbations and Time Scales (SPaTS): Control Theory and Applications; Guidance and Control of Aerospace Systems: Aeroassisted Orbital Transfer for Mars mission and Uninhabited Aerial Vehicles (UAVs); Advanced Control Strategies for Heating, Ventilation, & Air-Conditioning (HVAC); Modeling, Sensing and Control of Gas Metal Arc Welding (GMAW) and has over 200 journal and conference publications including 9 books.

e: dsnaidu@d.umn.edu

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