



## Desineni Subbaram Naidu

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**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 TED Talk on 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 and PhD degrees in Electrical Engineering (with specialization in Control Systems Engineering), from Indian Institute of Technology

(IIT), Kharagpur. He taught, visited and/or conducted research at IIT; as National Research Council (NRC) Senior Research Associate at Guidance and Control Division at NASA Langley Research Center, Hampton, VA; Old Domain University, Norfolk, VA; as Professor, Associate Dean and Director, School of Engineering at Idaho State University and Measurement and Control Engineering Research Center, Pocatello, Idaho; as National Research Council (NRC) Senior Research Associate at Center of Excellence in Advanced Flight Research at United States (US) Air Force Research Laboratory, Wright Patterson Air Force Base (WPAFB), Ohio; Visiting Research Professor at the University of Western Australia in Perth, Center for Industrial and Applied Mathematics at the University of South Australia in Adelaide; as Visiting Professor at the Center for Applied and Interdisciplinary Mathematics at East China Normal University, Shanghai, China; as Visiting Professor at the Institute of Systems Science, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China; Shanghai Jiao-Tong University, Shanghai, China. Since August 2014, he has been with University of Minnesota Duluth as Minnesota Power Jack Rowe Endowed Chair. He received twice the Senior National Research Council (NRC) Associateship award from the US National Academy of Sciences (NAS) and is an elected (Life) Fellow of the Institute of Electrical and Electronic Engineers (IEEE) and an elected Fellow of the World Innovation Foundation, United Kingdom. He has over 200 journal and conference publications including 8 books. He has been on the editorial boards of several journals including the IEEE Transactions on Automatic Control and Optimal Control: Applications and Methods (Wiley).

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