

Factories of the Future: A System of Systems Engineering Perspective

8th Annual System of Systems Engineering Conference
2-6 June 2013
Maui, Hawaii, USA



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ABSTRACT

Factories of the Future will be distinguished by intelligent machines, automation, human factors integration and knowledge management. Modelling and simulation is recognised as a key enabling technology essential to economic, social and environmental sustainability of future manufacturing systems. This talk will explore the history, recent achievements and directions in modelling and simulation for 21st century factories and supply chains. A systems science approach is employed, from stakeholder engagement through participative modelling to self-tuning and self-assembling simulations. Our contributions lower the cost of the application of modelling and simulation to manufacturing processes, enabling real time planning, dynamic risk analysis, dashboards and 3D visualisation. This realisation of the virtual factory integrates human factors and decisions into the core technology platform. The implications to future manufacturing enterprises are explored through a series of case studies from aerospace, mining and small and medium manufacturing enterprises.

About the Speaker

Saeid Nahavandi received his BSc (Hons), MSc and PhD in Control Engineering from Durham University, UK in 1985, 1986 and 1991 respectively.

Saeid is an Alfred Deakin Professor and the Director for the Centre for Intelligent Systems Research at Deakin University in Australia.

Professor Nahavandi is a Fellow member of IET, IEAust and Senior Member of IEEE and has published over 450 refereed papers and been awarded several competitive Australian Research Council (ARC) grants over the past five years. He received the Research collaboration / initiatives award from Japan (2000) and Prince & Princess of Wales Science Award in 1994. He won the title of Young Engineer of the Year Award in 1996 and holds two patents. In 2002 Professor Nahavandi served as a consultant to the Jet Propulsion Lab (NASA) during his visit to JPL Labs. In 2006 he received the title of Alfred Deakin Professor, the highest honour at Deakin University for his contribution to fundamental research.

Professor Nahavandi is the founder of the Centre for Intelligent Systems Research with 60 full time researchers at Deakin University. In modelling and simulation of complex systems he received awards from several organisations to focus on simulation based optimization of

manufacturing processes, airport operations, logistics and distribution centres. He has carried out industry based research with several major international companies such as GM, Ford, Holden, Nissan, Bosch, Futuris, Boeing, Vestas just to name a few. For his contribution in haptics and robotics he won two major research grants from the Australian Department of Defence on haptically enabled counter explosive robot design.

Professor Nahavandi was General Co-Chair for the IEEE SMC 2011. He also holds the position of Co-Editor-in-Chief for IEEE Systems Journal.