

Seminar Labex MS2T
"Control of Technological Systems of Systems"

<http://www.utc.fr/labexms2t/>



Professor Mo Jamshidi

University of Texas, San Antonio, USA

2013/02/04 – 02:00 p.m

Université de Technologie de Compiègne
Amphi Bessel - Centre de recherche de Royallieu
rue Personne de Roberval
60200 Compiègne



Abstract:

Systems engineering is at a crossroad now at this early part of the 21st Century. One of the main challenges of any paradigms in systems engineering is being able to handle complex systems under unforeseen uncertainties. A system may be called complex if its dimension (order) is too high and its model (if available) is nonlinear, interconnected, and information on the system is uncertain such that classical techniques cannot easily handle the problem. A system of systems (SoS) is a "super system," or an integration of complex systems coordinated together in such a way to achieve a wider goal with possible higher significance. Applications of SoS are quite extensive - examples are future combat mission, Global Warming, Mars missions, Air Traffic System, Global Earth Observation System, Smart Electric Power Grid, Energy systems, healthcare system, etc. Computational intelligence (CI) or Soft Computing, a consortium of fuzzy logic (approximate reasoning), neuro-computing (learning), genetic algorithms and genetic programming (optimization), has proven to be a powerful set of tools for adding autonomy and semi-autonomy to many complex systems. For such systems the size of autonomous controller architecture will be nearly infinite. In this lecture cyber-physical or system of systems are introduced, challenges are brought up and potential solutions and needs are discussed. Special emphasis will be made on applications of land rovers (vehicles), underwater rovers and unmanned aerial rovers (vehicles). Simulated and experimental results will be presented. Research at the University of Texas ACE Laboratory on robotic swarms, energy management and forecasting, etc. will be covered. Collaborative efforts between US and EU on this field will also be reviewed briefly.

Short Bio:

Mo M. Jamshidi (Fellow IEEE, Fellow ASME, Fellow AAAS, Fellow TWAS, Fellow NYAS, A. Fellow-AIAA, A. Fellow HAE) received BS in EE, Oregon State University, Corvallis, OR, USA in 1967, the MS and Ph.D. degrees in EE from the University of Illinois at Urbana-Champaign, IL, USA in June 1969 and February 1971, respectively. He holds honorary doctorate degrees from University of Waterloo, Canada, 2004 and Technical University of Crete, Greece, 2004. Currently, he is the Lutchter Brown Endowed Chaired Professor of the University of Texas Systems and working at the University of Texas, San Antonio, TX, USA. He has also been the founding Director of Center for Autonomous Control Engineering (ACE - ace.utsa.edu) at the University of New Mexico in 1995, and has moved at US Air Force Research Laboratory, KAFB, NM from 2002-2005 and 1984-1990. He was also a consultant with US Department of Energy Office of Industrial Technologies and DOE Laboratories Oak Ridge, Sandia and Los Alamos. He was also an advisor for the NASA Headquarters from 1998-2004 and on NASA JPL's Pathfinder Project mission and Surface Systems Track Review Board. He has worked in various academic and industrial positions at various national and international locations including with IBM and GM Corporations. In 1999, he was a NATO Distinguished Professor in Portugal conducting lectures on intelligent systems and control. During 1994-95 he was a Directeur du Recherche Associé due CNRS working at LAAS and University of Toulouse, Toulouse, France. In 2008 he was chosen as Royal Academy of Engineering Visiting Fellow in UK. He has over 620 technical publications including 64 books (12 text books), research volumes, and edited volumes. His most recent edited books are on system of systems engineering. Six of his books have been translated into at least one foreign language. He is or has been the Founding Editor or co-founding editor or Editor-in-Chief of 5 journals including IEEE Control Systems Magazine, the IEEE Systems Journal and Intelligent Automation and Soft Computing (AutoSoft) Journal. Dr. Jamshidi is a Fellow or member of 8 societies and academies. He is the recipient of the IEEE Centennial Medal and IEEE Control Systems Society Distinguished Member Award and the IEEE CSS Millennium Award. He was on the Board of Governors of the IEEE Society on Systems, Man and Cybernetics (2 terms) and currently board member of the IEEE Systems Council. He is an Honorary Professor at 6 Universities in China (Xian, Nanjing and East China Normal), UK (Birmingham), Hungary (Obuda) and Australian (Deakin). In October 2005 he was awarded the IEEE's Norbert Weiner Research Achievement Award. In April 2010 at the IEEE Systems Conference, one of his works on robotic swarm received the Best Paper Award among 140 papers in San Diego, CA.

