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**ABSTRACT**

***A System of Systems Framework for Intelligence in Autonomy, Big  
Data Analytic, and Applications***

Large data has been accumulating in all aspects of our lives for quite some time. Advances in sensor technology, the Internet, wireless communication, and inexpensive memory have all contributed to an explosion of “Big Data”. System of Systems (SoS) are integration of independent operatable and non-homogeneous legacy systems to achieve a higher goal than the sum of the parts. Today’s SoS are also contributing to the existence of unmanageable “Big Data”. Recent efforts have developed promising approach, called “Data Analytics”, which uses machine learning tools from statistical and soft computing (SC) such as principal component analysis (PCA), clustering, fuzzy logic, neuro-computing, evolutionary computation, Bayesian networks, deep architectures and deep learning, etc. to reduce the size of “Big Data” to a manageable size and apply these tools to a) extract information, b) build a knowledge base using the derived data, and c) eventually develop a non-parametric model for the “Big Data”. This keynote attempts to construct a bridge between SoS and Data Analytics to develop reliable models for such systems. A photovoltaic energy-forecasting problem of a micro grid SoS, traffic jams forecasting, brain disease prediction, and a system of autonomous vehicles will be offered for case studies. These tools will be used to extract a nonlinear model for a SoS-generated BIG DATA. Videos for autonomous vehicles will be shown.



**Mo M. Jamshidi** (Fellow IEEE, Fellow ASME, A. Fellow-AIAA, Fellow AAAS, A. Fellow TWAS, Fellow NYAS) received BS in EE, Oregon State University, Corvallis, OR, USA in June 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 the University of Waterloo, Canada, 2004 and Technical University of Crete, Greece, 2004. Currently, he is the Lutcher Brown Endowed Distinguished Chaired Professor at the University of Texas, San Antonio, TX, USA. He has been an advisor to NASA (including 1st MARS Mission), USAF, USDOE and EC/EU (Brussels). He has near 800 technical publications including 74 books (11 text books), research volumes, and edited volumes in English and a few foreign languages. He is the Founding Editor or co-founding editor or Editor-in-Chief or honorary editor of 6 journals including *IEEE Control Systems Magazine* and the *IEEE Systems Journal*. He is currently Special Issues Editor-in-Chief of *Intelligent Automation and Soft Computing* and honorary editor of *Int. Journal of Complex Systems*. He is an Honorary Professor at three Chinese Universities (Nanjing and Xi'an), Deakin University (Australia), Birmingham University and Loughbrough University (UK), and Obuda University (Hungary). He is a Foreign Member of the Hungarian Academy of Engineering and Russian Academy of Nonlinear Sciences. In October 2005 he was awarded the IEEE's Norbert Weiner Research Achievement Award. He is a member of the University of the Texas System Chancellor's Council since 2011. In his two research laboratories with 20 graduate students, he is currently involved in research on system of systems engineering with emphasis on cloud computing, robotics, UAVs, machine learning, bioinformatics and sustainable energy systems. He has over 10,590 citations on Scholar Google.