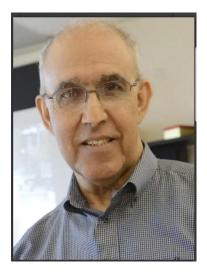# INES 2020

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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.

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