

A Big Wind Energy Data Analytic Paradigm - From PCA to Machine Learning

Mo Jamshidi and Barney Tannahill
ACE Laboratories, The University of Texas, San Antonio, USA

Large sets of data (numerical, textural and image) have been accumulating in all aspects of our lives for a long time. Advances in sensor technology, the Internet, social networks, wireless communication, cyber-physical systems (system of systems - SoS), and inexpensive memory have all contributed to an explosion of "Big Data". Big data comes in many ways in today's highly inter-connected world. Social networks, SoS and wireless systems are only some of the platforms creating big data. Wind energy has become a viable alternative to fossil fuels, especially in Europe. Recent efforts have developed a promising approach, called "Data Analytics", which uses statistical and computational intelligence (CI) tools such as principal component analysis (PCA), clustering, fuzzy logic, neuro-computing, evolutionary computation, Bayesian networks, etc. to reduce the size of "Big Data" to a manageable size. Then one can 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 paper attempts to develop a data analytic approach for wind energy forecasting. Database of wind energy are used here.

Biography

Mo Jamshidi is a Life Fellow IEEE, Fellow ASME, A. Fellow-AIAA, Fellow AAAS (American Association for Advancement of Science), Fellow TWAS (The World Academy of Sciences), and Fellow NYAS (New York Academy of Science), Fellow of Hungarian Academy of Engineering and Member of Russian Academy of Nonlinear Systems. He received BS (Cum Laud) in electrical engineering, Oregon State University, Corvallis, OR, USA in 1967, the MS and Ph.D. degrees in electrical engineering 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, Technical University of Crete, Greece, 2004 and Odlar Yourdu University, Baku, Azerbaijan in 1999. Currently, he is the Lutcher Brown Endowed Distinguished Chaired Professor at the University of Texas, San Antonio, TX, USA. He has over 9300 citations on Scholar Google.

Presenting author details

Full name: Mo Jamshidi
Contact number: 210 458 7074
Twitter account:
Linked In account:
Session name/ number:
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