DISTINGUISHED SPEAKER SERIES

Broadening the horizons of electrical engineering with experts from industry and academia

11:30 a.m. | March 6 | WEB 236C

Pizza will be provided

Modeling Temporal Dynamics in Time Series and Complex Networks

Zoran Obradovic, Laura H. Carnell Professor of Data Analytics
Data Analytics and Biomedical Informatics Center,
Computer and Information Sciences Department,
Statistics Department
Temple University

Accurate predictions at multiple temporal and spatial scales from multi-source data can potentially enable innovations across many industries. For example, moving from corrective to predictive maintenance of complex infrastructure could be more cost effective since early and interpretable risk predictions with uncertainty estimates allow optimization of the mitigation or prevention strategies. Similarly, in a proactive emergency monitoring, operating conditions are identified before they occur which can help deploy controls for avoiding undesirable outcomes. An overview of our projects aimed at predictive analytics in complex systems observed over time will be presented in this talk. Challenges and the proposed solutions will be discussed related to modeling noisy, unaligned, irregularly sampled, partially observed multivariate time series, exploiting dependencies among temporal patterns, and interpreting event occurrence for time-to-event estimation. The talk will also include discussion on how to capture the dynamics exhibited in attributed networks observed over time. The proposed algorithms are evaluated in the context of events prediction in a variety of application domains including computational advertising, genomics, healthcare, geosciences, unmanned aerial vehicles and power systems.

Zoran Obradovic is a Distinguished Professor and a Center director at Temple University, an Academician at the Academia Europaea (the Academy of Europe) and a Foreign Academician at the Serbian Academy of Sciences and Arts. He mentored 45 postdoctoral fellows and Ph.D. students, many of whom have independent research careers at academic institutions (e.g. Northeastern Univ., Ohio State Univ,) and industrial research labs (e.g. Amazon, Facebook, Hitachi Big Data, IBM T.J.Watson, Microsoft, Yahoo Labs, Uber, Verizon Big Data, Spotify). Zoran is the editor-in-chief at the Big Data journal and the steering committee chair for the SIAM Data Mining conference. He is also an editorial board member at 13 journals and was the general chair, program chair, or track chair for 11 international conferences. His research interests include data science and complex networks in decision support systems addressing challenges related to big, heterogeneous, spatial and temporal data analytics motivated by applications in healthcare management, power systems, earth and social sciences. His studies were funded by AFRL, DARPA, DOE, KAUST, NIH, NSF, ONR, and the PA Department of Health and industry. For more details see http://www.dabi.temple.edu/~zoran