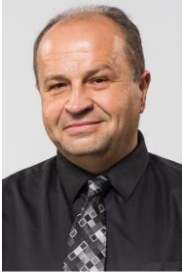


KIOS Distinguished Lecture Series



Prof. Zoran Obradovic

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

Wednesday, **12 July 2023**, at **11:00**

Amphitheatre **B108**

Events Detection, Classification, Prediction and Discovery of Precursor in Power Networks from Scarce and Imprecise Labels

LECTURE ABSTRACT

Accurate predictions at multiple temporal and spatial scales from many IoT devices can potentially enable innovations across various industries. For example, moving from corrective to predictive maintenance of complex infrastructure based on knowledge extracted by many IoT instruments could be more cost effective since this can facilitate early and interpretable risk predictions with uncertainty estimates and allow optimization of damage mitigation and prevention strategies. Similarly, in proactive emergency monitoring, IoT network could estimate operating conditions before they occur, which can direct deployment of control measures for avoiding undesirable outcomes. In this talk an overview of our recently developed machine learning methods to facilitate such end-to-end solutions will be discussed within the context of predictive analytics in a large electricity grid observed by multiple phasor measurement units. Challenges and the proposed solutions will be discussed related to (1) deep-learning based detection and classification of local and system-wide events using rapidly refined, partially inspected event labels; (2) digital-twin based data enhancement for events insufficiently represented in field-recordings over the training period; (3) transfer learning to leverage relevant labeled events from a different network to minimize additional labeling effort; and (4) spatio-temporal discovery of precursors using multi-modal data.

BRIEF BIO

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, eBay, 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, PA Department of Health, US Army ERDC, US Army Research Labs, and industry. For more details see <http://www.dabi.temple.edu/zoran-obradovic>