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Announcement

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Joint work with Hanoch Lev-Ari (NU)

On **Thursday, June 15, 2017**, in Hall 61 of the Faculty of Electrical Engineering, Belgrade, at **14:00** will deliver

LECTURE

Networked Estimation and Control in Cyber-Physical Energy Systems

Abstract: Electric power systems are among most spatially extended systems. Their stable operation in the presence of disturbances and outages is made possible by real-time control, both local and system-wide (over communication networks). Global optimization and control are key for achieving higher efficiencies in normal operation and for faster recovery from contingencies.

We describe a delay mitigation approach based on timestamping of transmitted signals, which can successfully mitigate the destabilizing effects of delay. By time-stamping we mean that every signal sample $x(t)$ is transmitted over the network as an ordered pair (x, t) , consisting of the sample value x and the corresponding sampling time instant t . We study in detail an estimator based on filtering ideas (Extended and Unscented Kalman filter and its robust extensions). In particular, we augment the standard EKF with delay-mitigation capability, and successfully apply it to an electromechanical example. We also incorporate into the EKF our bad-data detection and removal technique, and apply it to a Flywheel Energy Storage System. Finally, we have developed a robust version of the extended Kalman filter (EKF). Preliminary results suggest that our robust dynamic state estimation technique can be successfully applied in practical power system settings.

Biography: Aleksandar M. Stankovic obtained the Ph.D. degree from Massachusetts Institute of Technology in 1993 in electrical engineering. He serves as the A.H. Howell Professor at Tufts University; he was with Northeastern University, Boston 1993-2010. He is a Fellow of IEEE (2005) and serves as an Associate Editor for IEEE Transactions on Power systems and for Annual Reviews in Control. He previously served Transactions on Smart Grid and on Control System Technology in the same capacity (1996-2010). He has held visiting positions at the United Technologies Research Center (sabbaticals in 2000 and 2007) and at L'Universite de Paris-Sud and Supelec (in 2004). He is a co-editor of book series on Power Electronics and Power Systems for Springer.



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