



RETHINKING PRINCIPLES OF MODELING, SIMULATIONS AND CONTROL FOR THE CHANGING ELECTRIC ENERGY SYSTEMS

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[wsu.zoom.us/j/5226526738]

OVERVIEW

In this talk, we revisit the way we model electric power systems and assumptions made. This is done with an eye on fundamental challenges and missed opportunities for enhanced electricity services. Instead of focusing on specific technology, we view the problem of sustainable and resilient electricity service as the complex social-ecological system problem, which can be greatly enabled by the distributed minimally coordinated grid operations. For this to work, developed principles are based on our recently introduced multi-layered modeling framework for posing the problem of safe, robust and efficient design and control for rapidly changing electric energy systems. This approach is shown to be particularly well suited for scalable optimization of large-scale complex systems. Theoretical foundations for Dynamic Monitoring and Decision Systems (DyMonDS) framework envisioned as the next-generation SCADA and operating protocols for the changing electric energy systems will be discussed. The control design for microgrids and integration of renewable resources and demand response is used as an example to illustrate potential benefits of this approach. Finally, many open modeling, estimation and optimization challenges/opportunities using this modeling approach will be discussed.

BIO

Marija Ilić serves as Professor Emeritus at Carnegie Mellon University. She is currently a Senior Staff at the MIT Lincoln Laboratory, and a Senior Research Scientist at MIT's Institute for Data, Systems and Society (IDSS)/LIDS. She is an IEEE Life Fellow. Dr. Ilic was the first recipient of the NSF Presidential Young Investigator Award for Power Systems; signed by late President Ronald Regan. In addition to her academic work, she is the founder of New Electricity Transmission Software Solutions, Inc. (NETSS, Inc.). She has co-authored several books on the subject of large-scale electric power systems and has co-organized an annual multidisciplinary Electricity Industry conference (<http://www.ece.cmu.edu/~electricconf>).

