



MACHINE LEARNING FOR POWER SYSTEMS: FROM PURE DATA-DRIVEN TO PHYSICS-INFORMED METHODS

~ by ~

DR. Nanpeng Yu

Associate Professor, Dept of Electrical and Computer Engineering
University of California, Riverside

Tuesday, September 7 • 11:00 AM – Noon (PT) • TEAMS ONLY

[\[Click here to join meeting\]](#)

OVERVIEW

The electric utility industry is being swamped by petabytes of data coming from various sources such as smart meters, phasor measurement units, SCADA systems, geographical information systems, and customer management systems. The primary and secondary value imbedded in the complex and heterogeneous data sets from power systems is immense. However, algorithms and applications for unlocking the potential of big data in power systems are at an early stage of development. Although off-the-shelf machine learning algorithms could improve the efficiency, reliability and resiliency of power systems, their potential is limited by the lack of physical-domain knowledge. This talk first covers the key applications of machine learning in power systems. Then I will present various pure data-driven and physics-informed machine learning algorithms for power transmission and distribution systems.

BIO

Dr. Yu received his BS in Electrical Engineering from Tsinghua University, Beijing, China (2006). He received his MS degrees in Electrical Engineering and Economics and PhD from Iowa State University in 2010. Before joining University of California, Riverside, Dr. Yu was a senior power system planner and project manager at Southern California Edison from January 2011 to July 2014.



Currently, he is an associate professor of Electrical and Computer Engineering at the University of California, Riverside. Dr. Yu is the recipient of the Regents Faculty Fellowship and Regents Faculty Development award from University of California. He received multiple best paper awards from IEEE Power and Energy Society Grand International Conference and Exposition Asia and the Second International Conference on Green Communications, Computing and Technologies. Dr. Yu also received three best paper finalist awards from IEEE Power and Energy Society General Meeting.

Dr. Yu is the director of Energy, Economics, and Environment Research Center at UC Riverside. Dr. Yu is also a cooperating faculty member of department of computer science and engineering and department of Statistics. He currently serves as the vice chair distribution system operation and planning subcommittee of IEEE Power and Energy Society and the chair for IEEE Power and Energy Society Working group of data-driven modeling, monitoring and control for Power Distribution Networks. Dr. Yu currently serves as the associate editor for IEEE Transactions on Smart Grid, IEEE Transactions on Sustainable Energy, and IEEE Power Engineering Letters.