



## **A Distributed Online Algorithm for Optimal Real-time Energy Distribution in Smart Grid**

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### **Abstract**

A smart grid is an electrical grid that is enhanced with communications and networking, computing, and signal processing technologies. Unlike the traditional power grid that is strictly hierarchical, the smart grid is characterized by the two-way flows of electricity and real-time information, which offers tremendous benefits and flexibility to both users and energy providers. Energy storage systems can then cooperate with distributed renewable energy resources (DRERs) to balance the supply and demand, and users can adapt their demand for energy according to the market price fluctuations.

The new features of smart grid, along with the smart devices and smart meters also bring new perspectives to energy management and demand response. This talk brings a new distributed online algorithm for electricity energy distribution in a smart grid environment which formulates an optimization problem capturing the user's utility and cost, grid load smoothing, dynamic pricing, and energy provisioning cost. It also requires minimal statistical information, for optimizing the electricity allocation.

### **Bio**

Yu Wang is a doctoral student in the Department of Electrical and Computer Engineering at Auburn University. He is advised by Professor Shiwen Mao. Prior to joining Auburn University, Yu obtained his M.S. degree in Electrical Engineering, in 2011, from Southeast University, Nanjing, China. His research interests include demand-side management and Microgrid optimization in smart grid. At present, Yu's research focus is on demand response in a Microgrid environment.

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