#### DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

# Power System and Electricity Market Operation and Optimization

# Large-scale Power System Optimization and Computation

- Power system operation and planning under uncertainty
- Grid integration of renewables, electric vehicles and energy storage
- GPU-based parallel computing and high performance computing
- Microgrid control

# Electricity Market Modeling, Monitoring and Simulation

- Testbed of complex markets modeling
- Optimization and reinforcement-learning based bidding strategy development
- Market design and evaluation
- Energy and price forecasting
- Emerging technology and energy policy evaluation

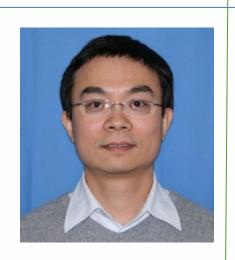
#### Cyber Physical System Security of Power Systems and Electricity Markets

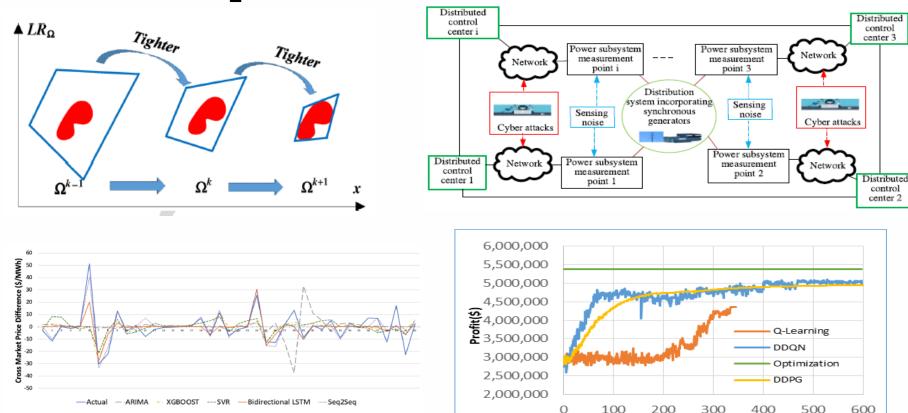
- State estimation of networked systems
- False data injection attacks and counter measures
- System vulnerability and enhancement

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- DARPA
- NSF
- Department of Energy
- DOD ESTCP
- Industry





Optimization, State Estimation, Energy Forecasting, Reinforcement Learning

# Keywords

• Grid, optimization, uncertainty, parallel computing, machine learning, cyber security, energy forecasting, state estimation

### **Recognitions**

- National Science Foundation CAREER Award, 2024
- ISC Distinguished Investigator Award, 2022
- 2021-2022 Dean's Scholar Award
- University of Missouri System President's Award for Career Excellence Early Career, 2020
- Faculty Excellence Award, 2020
- DARPA Young Faculty Award, 2018



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