Real-time Data Analytics for Energy Cyber-Physical Systems

- People
  - Maggie Cheng, New Jersey Institute of Technology
    - Website: https://web.njit.edu/~chengm
    - Email: maggie.cheng@njit.edu
  - Mihai Anitescu, University of Chicago
    - Website: https://galton.uchicago.edu/faculty/anitescu.shtml
    - Email: anitescu@galton.uchicago.edu
  - David C. Schooley, Commonwealth Edison/Exelon Corp

- CNS[1660025]

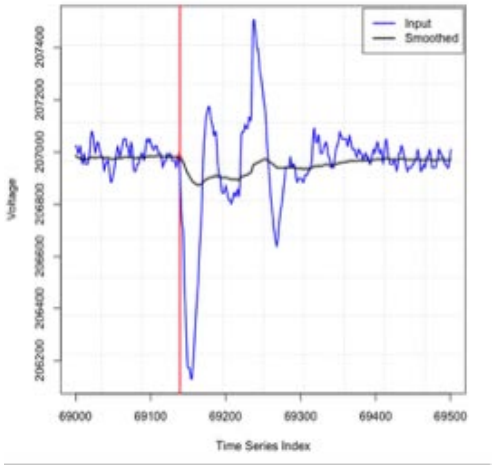
Description

Objectives:

- Improve system understanding and situational awareness
- Automatic monitoring and control of grid

Data Analytics

- **Something abnormal observed.**
- **What happened?**
- **Where did it happen?**



Three focus areas:

1. Online event detection
2. Fault identification and localization
3. Optimization and control

Findings

1. On event detection:
    - Offline vs online
    - Improved timeliness in detection

2. On event diagnosis:
    - Solving power system equations vs learning from data
    - Learning from data can effectively identify line outage, multiple line outages without solving power system equations or even knowing power system matrices