

# IEEE PES Subcommittee on Big Data & Analytics

Chair: Prof. Le Xie, Texas A&M University

Vice Chair: Dr. Yannan Sun, Oncor Electric Delivery

Secretary: Dr. Hung-Ming Chou, Dominion Energy

8/10/2020, 9-11 AM (Eastern Time)



# Agenda

- Welcome and Member Introduction
- Approval of 2019 meeting minutes
- Announcements
- NSF Program Manager Update
- Subcommittee sponsored activities for the past year
- TCPC reports on GM2020 papers and panel sessions
- Call for panel ideas for GM2021
- New proposed initiatives
- Future activities

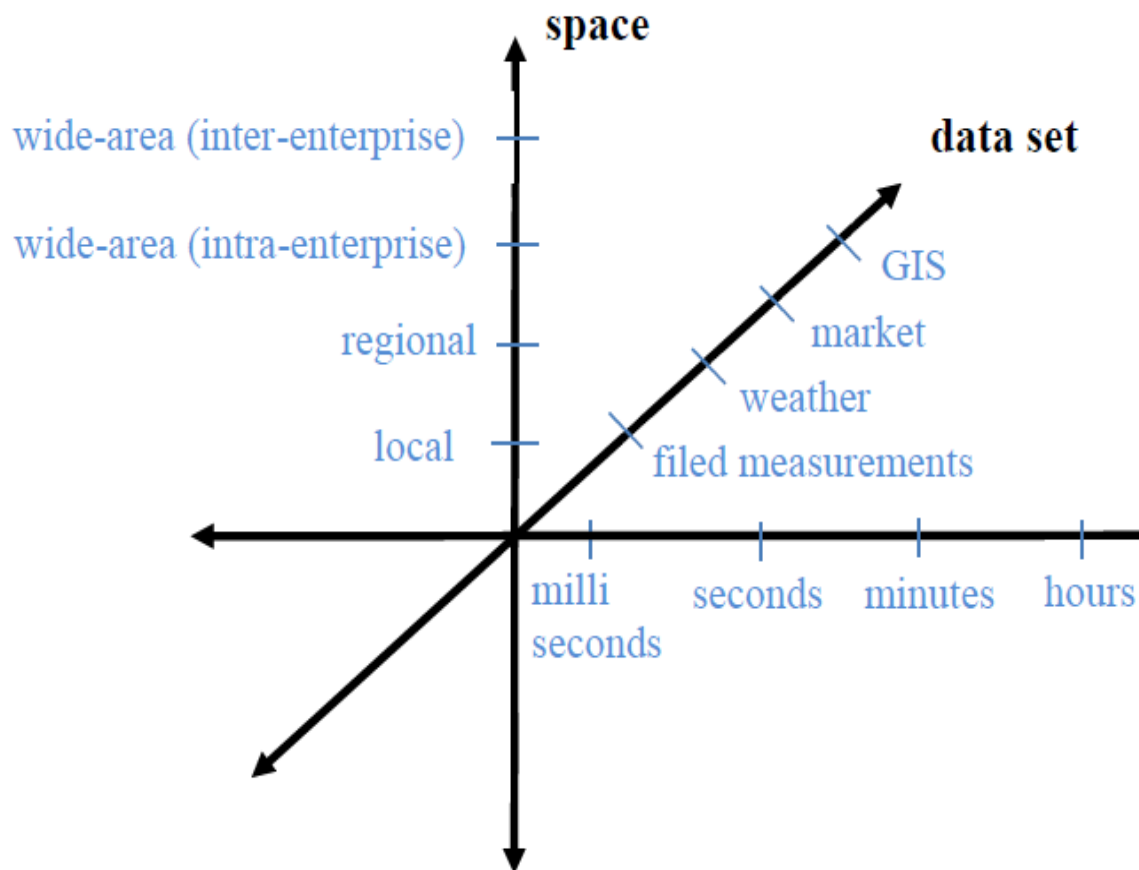


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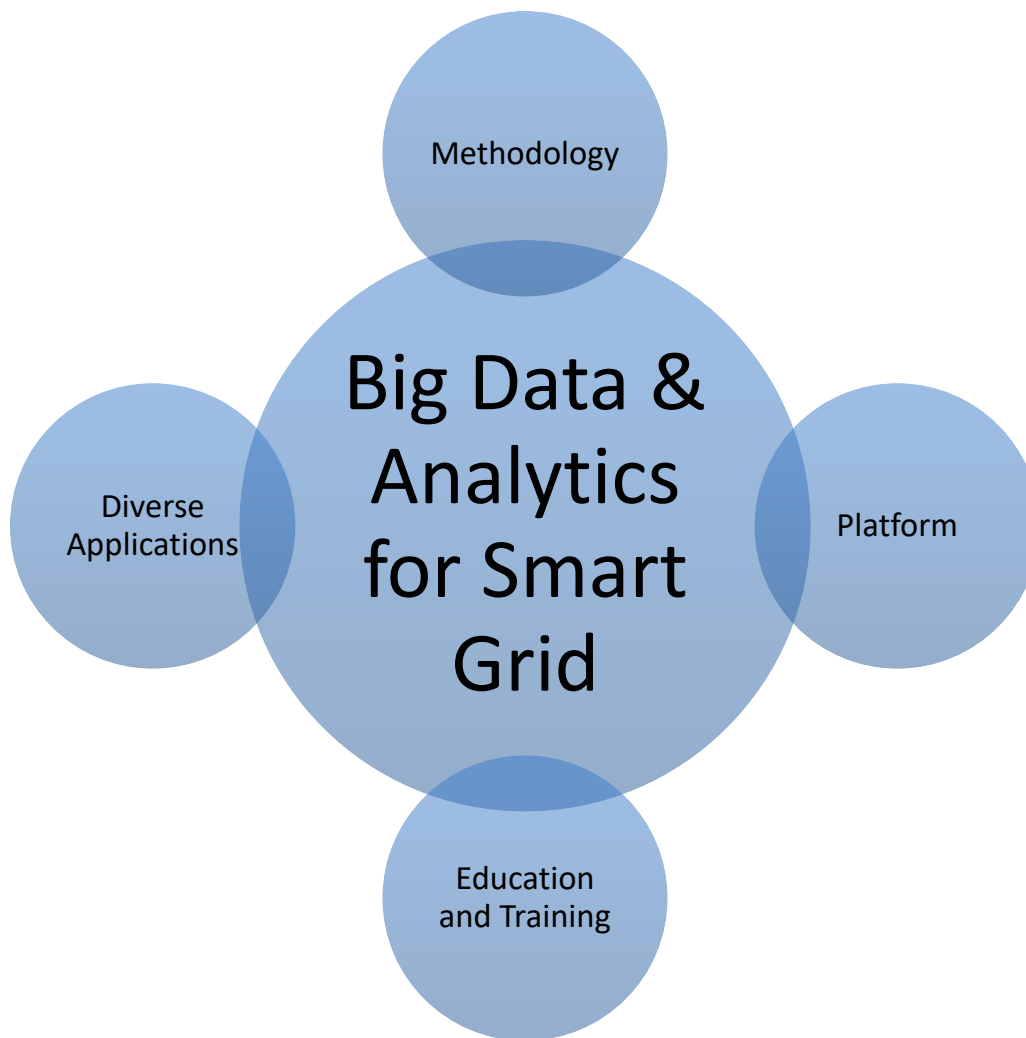


# Big Data & Analytics Subcommittee: A Focal Point of Talents and Resources



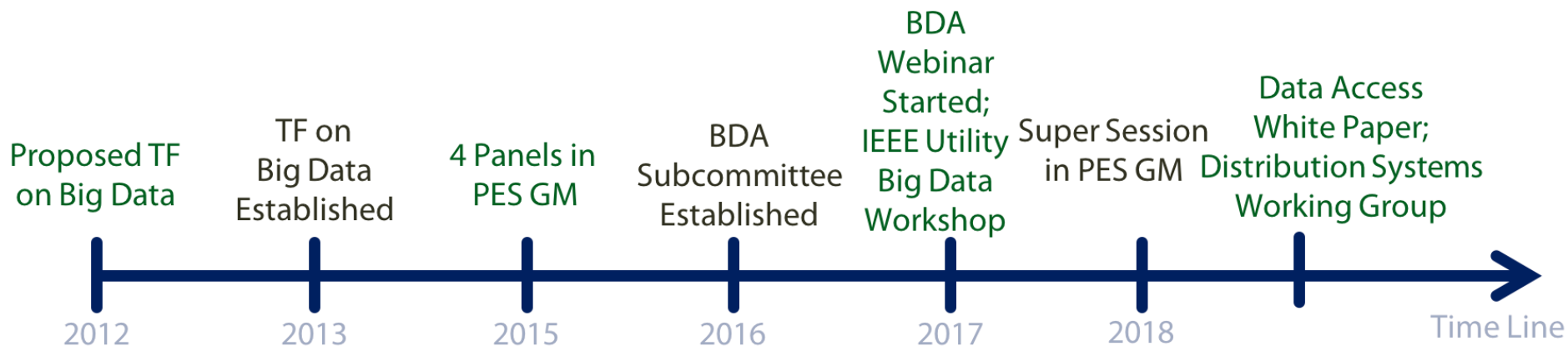
*What is the value proposition of big data in power grid?*

# Value Proposition



# A Trajectory of Growth and Impact

**30+ panels**  
**1500+ participants**



## **BDA Mission:**

The BDA subcommittee focuses on developing and advancing data-driven analytics for power grid planning and operation. In particular we analyze “big” datasets---those data with at least one of: large volume, high velocity, diverse variety, and high veracity. We seek to amplify impact through deep collaborations among academia, industry, and regulatory agencies by promoting data-driven solutions of real-world problems.

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# Minutes from 2019 meetings

Draft minutes for 2019 IEEE PESGM Big Data Analytics (BDA) Subcommittee Meeting  
August 13, 2019  
Atlanta, GA

## 1. Introduction

Le Xie introduced the subcommittee and reviewed the meeting agenda

## 2. Approval of minutes from the 2018 meeting

Hamed Mohsenian-Rad moved, Nanpeng Yu seconded. Members voted in favor of approving the 2018 meeting minutes

## 3. Announcements/summary

- Papers statistics: total paper submitted: 40, accepted: 20. Transaction paper: 4. Thanks for all the reviewers for their help.
- Activities from last year
  - Organize annual workshop on big data analytics in smart grid community
- Subcommittee website is established and is linked with AMPS (<http://sites.ieee.org/pes-bdaps/>)
- Report from WG/TF
  - Big data application in power distribution system TF
    - Organize workshop, tutorial
    - Work on 2<sup>nd</sup> edition of the “Big Data Application in Power System”
    - Contribute to education of engineers by delivering 1-day short course
    - Develop a new graduate level course entitled Machine Learning and Big Data Analytics in Smart Grid
  - Big data webinar series TF
    - Moved from the industrial topic to the academic topic this year
    - Invite, organized and coordinated 7 talks
    - Build a website and allow people to subscribe the webinar announcement
    - Plan for expanding the website into an interactive learning site
    - <https://www.public.asu.edu/~yveng2/Tutorial5/>
  - Data access WG
    - Complete and launched the website <https://bigdata.seas.gwu.edu>
    - Holding a tutorial on big data analytics at IEEE SGSM
    - Organize the special issue at IEEE Transactions on Smart Grid on Distribution synchrophasors
- Panel session chairs provided updates on the BDA sponsored panels at 2019 PES GM:
  - **Panel session: Big data analytics for power system economy, reliability and security** (Session chair: Wei Hu, Nanpeng Yu) [40 people]
  - **Panel session: Frontiers of big data analytics in the operation and maintenance of power distribution systems** (Session chair: Zhouyang Ren, Yunhe Hou) [80-90 people]
  - **Panel session: Data analytic tools for dynamic security assessment of bulk power systems** (Session chair: Rafael Segundo, Emilio Barocio) [60-70 people]

## 4. Proposed 2020 GM panel session

- It is highly encouraged to contact with other subcommittee for panel slot
- Please submit the panel proposal to subcommittee. Subcommittee will ask members to vote to rank the proposals
- Panel for T&D conference deadline is on August 15<sup>th</sup>
- Dr. Kezunovic proposed synchrophasor big data analytics for T&D
- Derek Kou made the presentation on solar data analytics
- Steven propose big data analytics for operation for T&D
- Asset management for GM
- Integration of data

## 5. New Initiative

- We are relatively young subcommittee. We want a thoughtful growth and try to attract talent. The key is to be able to substantiate the efforts.
- It is important to differentiate proposed TF/WG from other TF/WG
- Please submit the TF proposal, describing the concrete scope, deliverable, and outcome
- Big data application in power distribution system TF will be converted to WG with bigger scope. Nanpen will circulate the proposal of WG
- Song Zhang and Xiaochuan Luo present proposed TF on application of cloud computing in power system
- Di Shi present proposed TF on Internet of Things for Electric power systems
- Jie Zhang and Yingchen Zhang proposed TF on Predictive Analytics: Power, Meteorology, and Climate

## 6. Future activities

- Currently the BDA core team consists of Chair, Vice-chair, Secretary, TF leaderships, and IEEE Big Data liaison, the core team will meet bi-weekly or quarterly for subcommittee activities.
- Will host annual workshop on the big data analytics for smart grid community. We will need volunteer

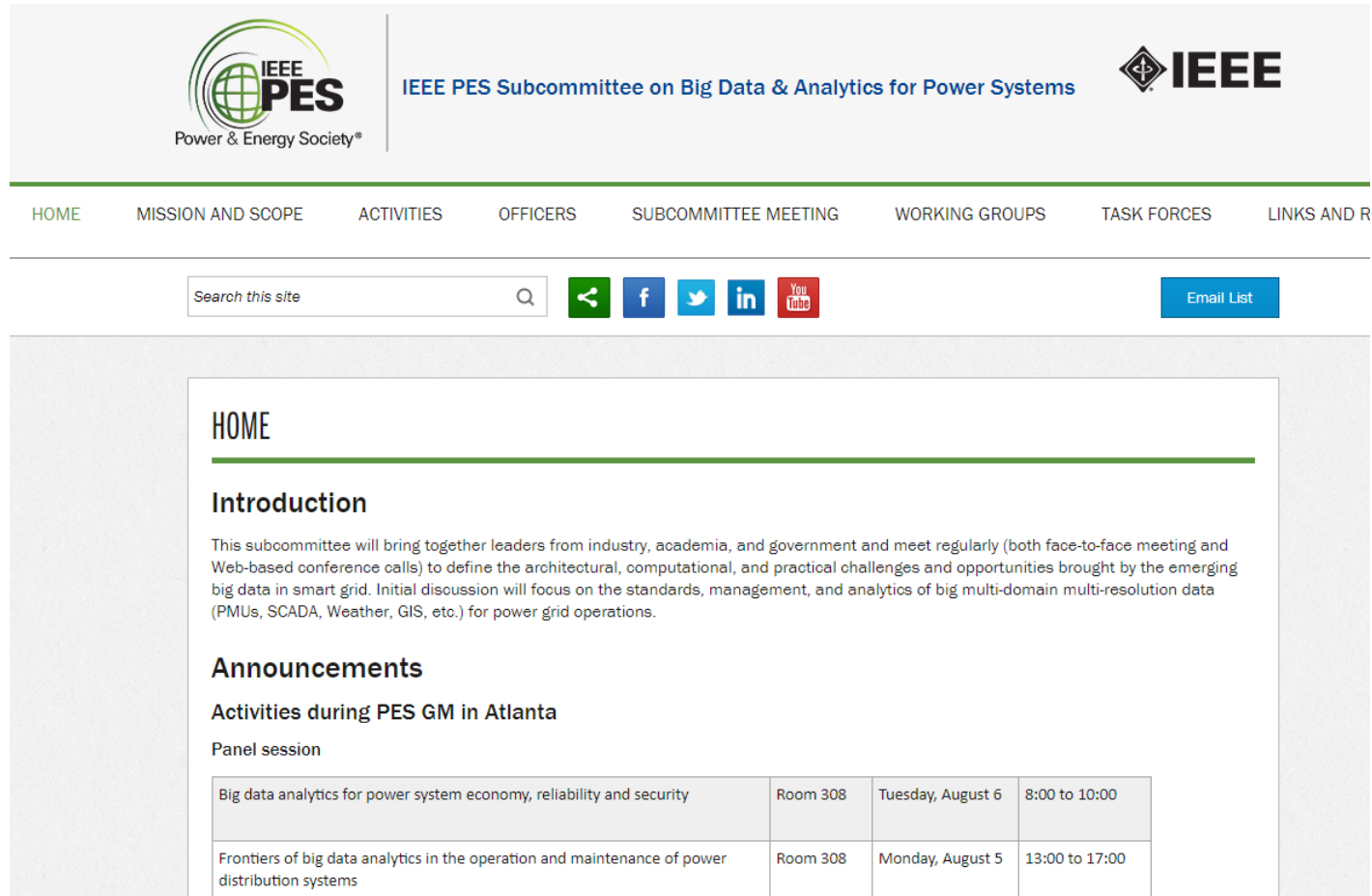


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# Website Established and linked with AMPS



IEEE PES  
Power & Energy Society®

IEEE PES Subcommittee on Big Data & Analytics for Power Systems

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## HOME

### Introduction

This subcommittee will bring together leaders from industry, academia, and government and meet regularly (both face-to-face meeting and Web-based conference calls) to define the architectural, computational, and practical challenges and opportunities brought by the emerging big data in smart grid. Initial discussion will focus on the standards, management, and analytics of big multi-domain multi-resolution data (PMUs, SCADA, Weather, GIS, etc.) for power grid operations.

### Announcements

#### Activities during PES GM in Atlanta

Panel session

Big data analytics for power system economy, reliability and security	Room 308	Tuesday, August 6	8:00 to 10:00
Frontiers of big data analytics in the operation and maintenance of power distribution systems	Room 308	Monday, August 5	13:00 to 17:00

<http://sites.ieee.org/pes-bdaps/>

# TCPC Announcements

- GM2021: July 25 - 29, 2021 in Washington, DC, USA.
- Deadline for tutorial proposals for GM2021: **Aug 31, 2020**. All applications need to be submitted at <https://www.ieee-pes.org/ieee-pes-2021-call-for-tutorials>
- WG/TF attending poster session at GM2021: **May 1, 2021**. [Yannan.Sun@Oncor.com](mailto:Yannan.Sun@Oncor.com)
- Deadline for panel proposals: **Oct 15, 2020**. [Hung-Ming.Chou@dominionenergy.com](mailto:Hung-Ming.Chou@dominionenergy.com)

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# Report from Working Group/ TF meeting

- Data-driven Modeling, Monitoring and Control in Power Distribution Networks WG (new in 2020, Nanpeng Yu)
- Data Access WG <https://bigdata.seas.gwu.edu/>
- Big Data Webinar Series TF (Yang Weng)
- Application of Cloud Computing in Power System TF (new in 2020, Song Zhang)
- Application of Big Data Analytics on Transmission System Dynamic Security Assessment TF (new in 2020, Rafael Segundo, Yanli)

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# GM2020 Papers

- 2020 Papers for PES GM
  - Total paper submitted: 81
  - Accepted: 39 (27 were presented)
  - Best papers submitted by BDA:
    - Improving Aggregated Load Forecasting Using Evidence Accumulation k-Shape Clustering, Yufan Zhang, et al.
    - A Method for Power System Transient Stability Assessment Based on Transfer Learning, Junyu Ren, et al.
    - Conductor Galloping Detection on Imbalanced Datasets: SVM with Smart Sampling, Kui Wang, et al.
    - Physics-Informed Neural Networks for Power Systems, Georgios Misyris, et al.
- Thanks to all the reviewers. All the authors have received detailed review comments and suggestions
- Reminder to authors: explain the impact of your work
- Looking for reviewers who are experts on deep learning

Committee	Best Papers Quotas	Paper Forum Quotas
Total Analytical Methods for Power Systems	18	55
Big Data Analytics	4	10



# Panels in GM 2020

## AMPS Total: 32, BDA: 7

- **Predictive Big Data Analytics for Outage Management**  
(Session chair: Mladen Kezunovic)
- **Artificial Intelligence and the Future of Distribution Management Systems**  
(Session chair: Reza Arghandeh, Hamed Mohsenian-Rad)
- **Integration of various source data for enhanced situational awareness of power system**  
(Session chair: Yanli Liu)
- **Learning to Model, Monitor, and Control Power Distribution Systems**  
(Session chair: Nanpeng Yu, Vassillis Kekatos)
- **Advanced Data Analytics for Power Asset Management**  
(Session chair: Ming Dong, Fangxing Li)
- **Learning to Optimize Power Transmission Systems**  
(Session chair: Vassillis Kekatos, Lang Tong)
- **Observability and controllability of power distribution system in big data era**  
(Session chair: Yi Wang, Yang Weng)

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## Presentation & Discussion of proposed panel for 2020 GM

- Deadline for submitting a panel proposal: **Oct 15**
- Joint proposals between BDA and other subcommittees are highly encouraged this year
- Proposal template will be sent to all registered attendees after this meeting
- 5-minute proposal presentations
  - Yanli Liu
  - others

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## Presentation & Discussion of proposed WG/TF

- Blockchain Applications in Electrical Power Systems TF (currently on hold, looking for co-chairs)
- 5 minutes for each person
- Presentation

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# We Need Volunteers!

- How to sign up?
  - Email [le.xie@tamu.edu](mailto:le.xie@tamu.edu) and mention your interest
  - Please mention which initiative(s) you are interested.
  - Interested in reviewing papers?

Please contact TCPC at  
[yannan.sun@oncor.com](mailto:yannan.sun@oncor.com)

<http://sites.ieee.org/pes-bdaps/>

