

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

7/19/2021, 10-12 AM (Eastern Time)



Agenda

- Welcome and Member Introduction
- Approval of 2020 meeting minutes
- Announcements
- Subcommittee sponsored activities for the past year
- TCPC reports on GM2021 papers and panel sessions
- Call for panel ideas for GM2022

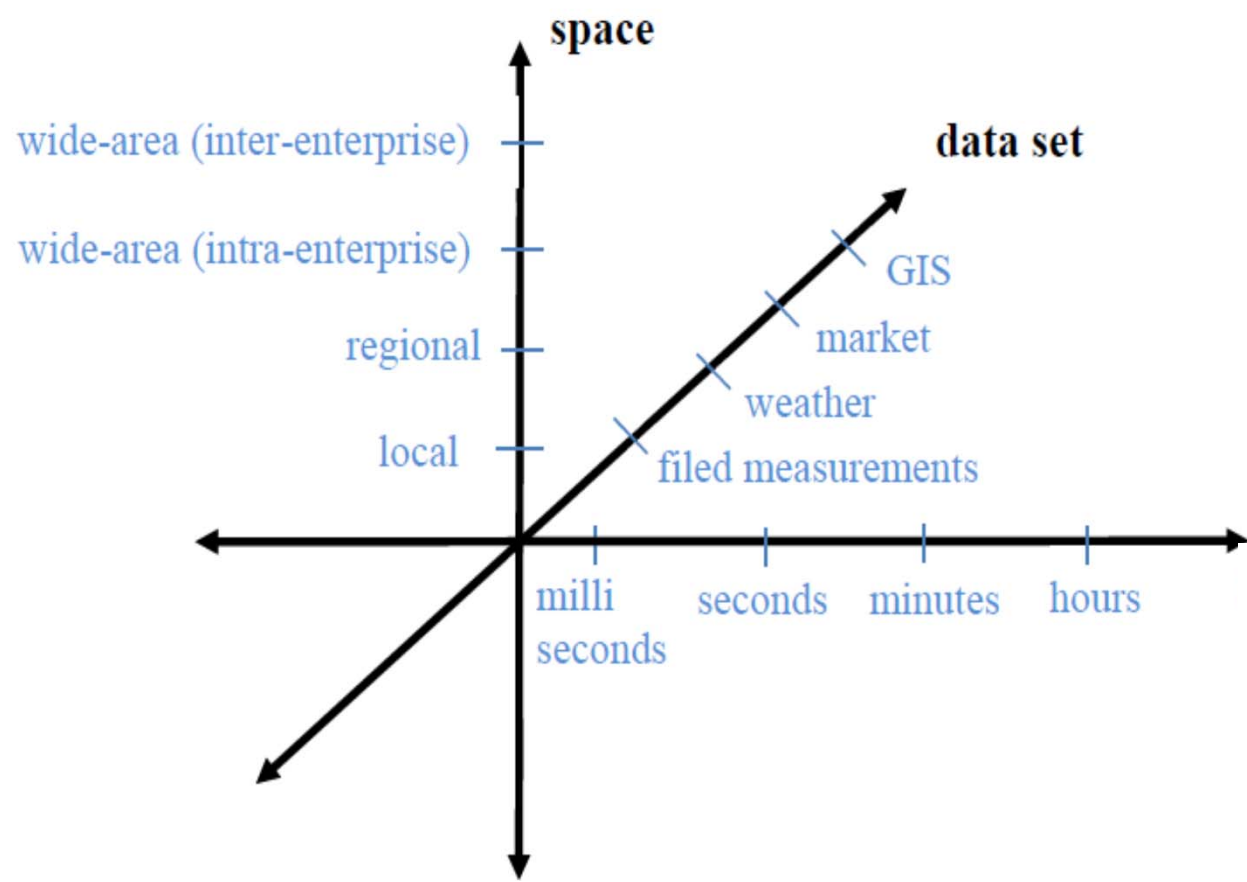


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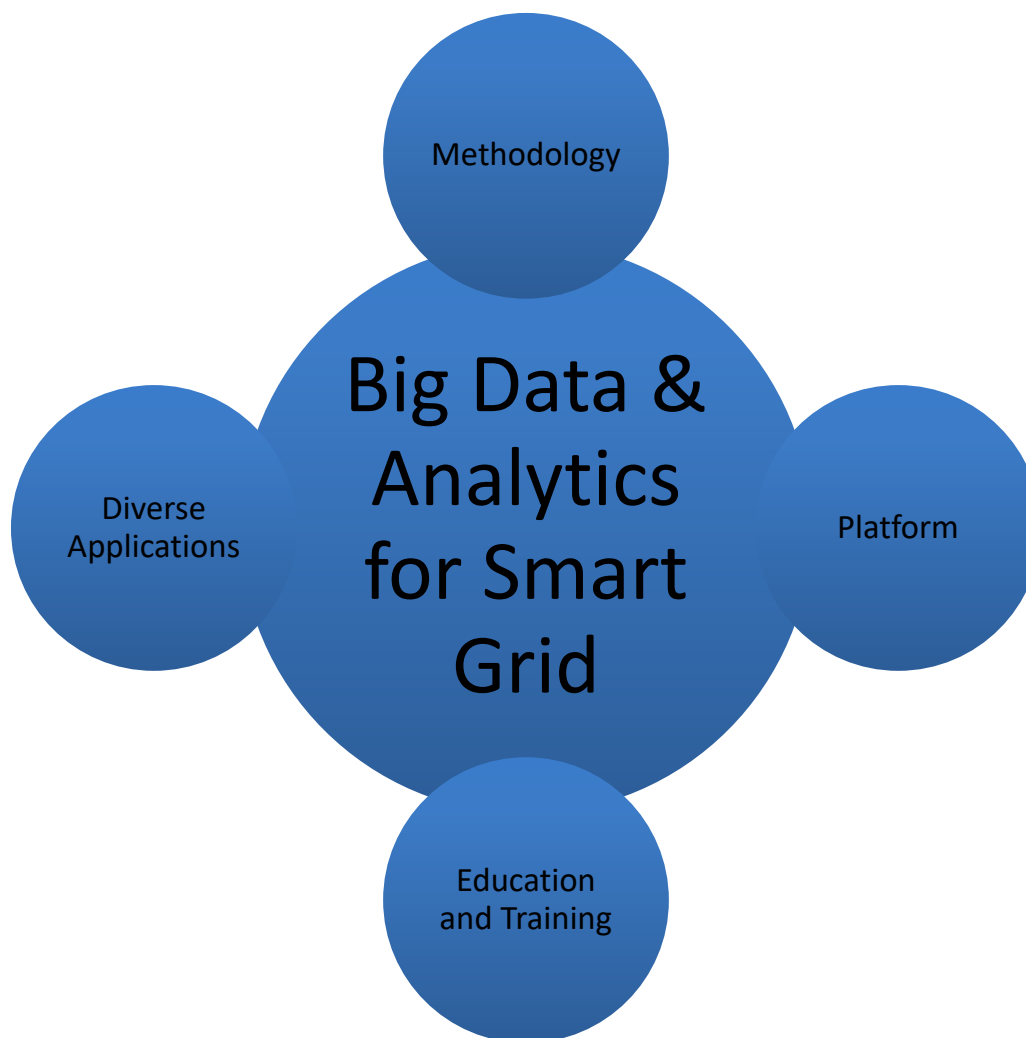


Big Data & Analytics Subcommittee: A Focal Point of Talents and Resources



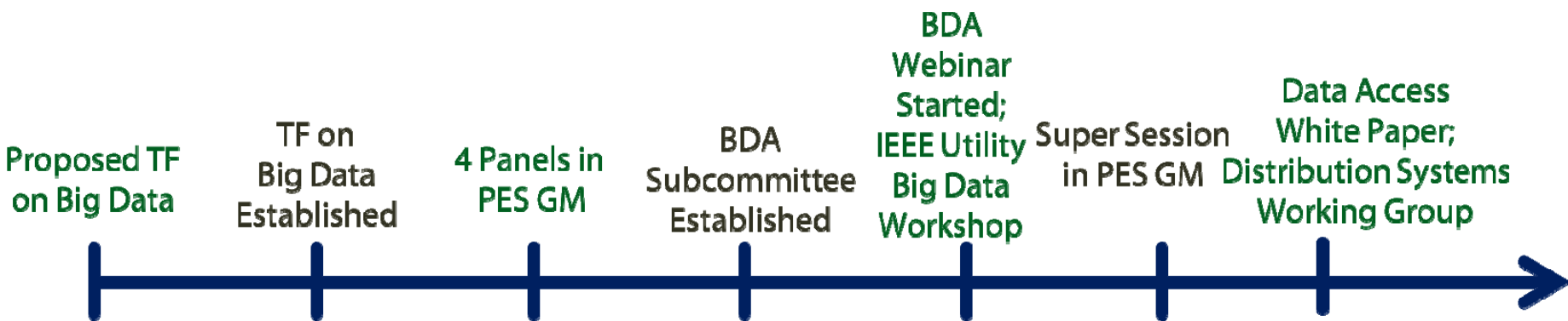
What is the value proposition of big data in power grid?

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 2020 meetings

1. Introduction

Le Xie introduced the subcommittee and reviewed the meeting agenda

2. Approval of minutes from the 2018 meeting

Xiaochuan Luo moved, Yang Weng seconded. Members voted in favor of approving the 2019 meeting minutes

3. Announcements/summary

- Papers statistics: total paper submitted: 81, accepted: 39. Thanks for all the reviewers for their help.
 - TCPC announce the deadline for tutorial proposal and panel proposal for 2021 GM
 - NSF Program manager provided update
 - 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 during PES GM and DistribuTech
 - Prepare white papers, magazine articles and technical reports
 - Build tasks groups for applications/use case
 - White papers for application/use case
 - <https://intra.ece.ucr.edu/~nyu/IEEE%20PES%20WG.html>
 - 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
 - Proposal to convert into a working group
 - Triangle concept: webinar, Advisor group and BDA competition (sponsoring RTE)
 - <https://www.public.asu.edu/~vweng2/Tutorial5/>
 - Application of big data analytic on transmission system dynamic security assessment
 - Present the mission and scope
 - Activities in 2020 and 2021, including meeting, panel session, virtual workshop and report
 - <https://www.zhaw.ch/en/engineering/institutes-centres/iefef/energy-storage-and-energy-grids/electric-power-systems-and-smart-grids/task-force-application-of-big-data-analytic-on-transmission-system-dynamic-security-assessment/>
 - Cloud computing for power grid operation, planning, monitoring and control TF
 - Review major events
- TF meeting format: presentation and discussion
- Presentation is about the use cases of cloud computing in power grid business
- Future activities: Bimonthly meeting
- <https://sites.google.com/view/cloud4powergrid/>
- Panel session chairs provided updates on the BDA sponsored panels at 2020 PES GM:
 - **Predictive Big Data Analytics for Outage Management**
(Session chair: Miladen 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)

4. Proposed 2021 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 proposal presentation
 - Yanli Liu: Advanced data analytics for probabilistic security assessment
 - Songzhang: Securely and reliably leveraging cloud computing for grid operation
 - Reza Arghandeh: Artificial intelligence to cope extreme natural events in power system

5. New Initiative

- Outreach to IEEE smart grid initiative
- Potential of a series of workshop during ISGT
- Outreach to PEEC research subcommittee on a potential panel in GM 2020 on data science for power system education
- 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

6. Future activities

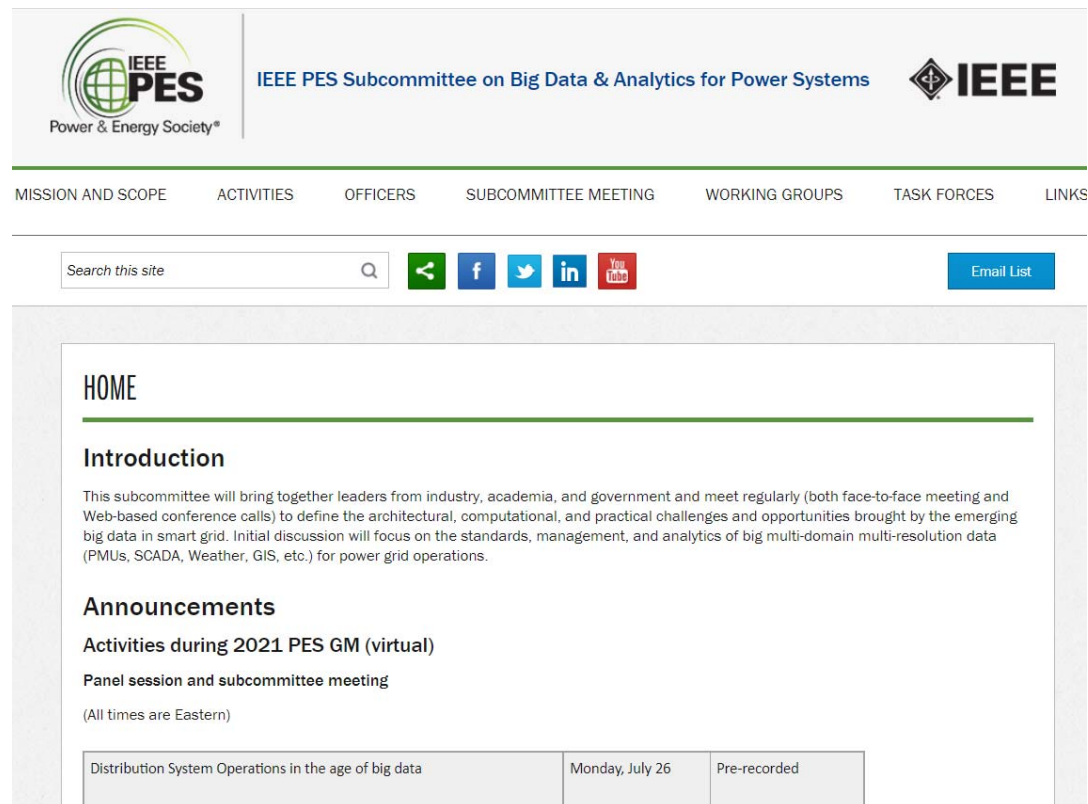
- Currently the BDA core team consists of Chair, Vice-chair, Secretary, TF leaderships, and IEEE Big Data liaison, the core team will meet bi-weekly or quarterly for subcommittee activities.
- Will host annual workshop on the big data analytics for smart grid community. We will need volunteer

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Website Established and linked with AMPS



The screenshot shows the website header with the IEEE PES logo (Power & Energy Society®) and the IEEE logo. The title is "IEEE PES Subcommittee on Big Data & Analytics for Power Systems". The navigation menu includes: MISSION AND SCOPE, ACTIVITIES, OFFICERS, SUBCOMMITTEE MEETING, WORKING GROUPS, TASK FORCES, and LINKS. Below the navigation is a search bar labeled "Search this site" and social media icons for Facebook, Twitter, LinkedIn, and YouTube. An "Email List" button is also present.

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 2021 PES GM (virtual)

Panel session and subcommittee meeting

(All times are Eastern)

Distribution System Operations in the age of big data	Monday, July 26	Pre-recorded
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<http://sites.ieee.org/pes-bdaps/>

TCPC Announcements

- GM2022: July 17 - 21, 2022 in Denver, CO.
- Deadline for tutorial proposals for GM2022: **Aug 6, 2021**. All applications need to be submitted at <https://www.ieee-pes.org/ieee-pes-2022-call-for-tutorials>
- WG/TF attending poster session at GM2022: Please send a note to Yannan.Sun@Oncor.com
- Deadline for panel proposals: **September 3rd, 2021**. Hung-Ming.Chou@dominionenergy.com

Leadership Transition

- Leadership Now:
 - Dr. Le Xie served as the founding chair since 2017
 - Dr. Yannan Sun (Oncon) served as TCPC/Vice Chair
 - Dr. Hung-Ming Chou (Dominion) served as Secretary
- Transition Plan (according to AMPS Operation Manual)
 - Dr. Yannan Sun (Oncon) serves as chair
 - Dr. Hung-Ming Chou (Dominion) serves as TCPC/Vice Chair

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Workshop on Grid Resiliency

- More than 600 participants
- Leaders from DOE, Utilities, Vendors, and Universities
- Rui Yang/Payment Dehghanian/Qun Zhou

2021 IEEE Big Data & Analytics for Power Systems Workshop 4-5 February 2021

Advancing Energy Infrastructure Resilience
using Data Analytics and Artificial Intelligence

IEEE SMARTGRID IEEE PES IEEE
Power & Energy Society®
IEEE PES Big Data & Analytics Subcommittee

Report from Working Group/ TF meeting

- Data-driven Modeling, Monitoring and Control in Power Distribution Networks WG (new in 2020, Nanpeng Yu)
<https://intra.ece.ucr.edu/~nyu/IEEE%20PES%20WG.html>
- Big Data Webinar Series TF (Yang Weng)
<https://www.public.asu.edu/~yweng2/Tutorial5/>
- Application of Cloud Computing in Power System TF (new in 2020, Song Zhang)
<https://sites.google.com/view/cloud4powergrid/>
- Application of Big Data Analytics on Transmission System Dynamic Security Assessment TF (new in 2020, Rafael Segundo, Yanli)

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GM2021 Papers

- 2021 Papers for PES GM
 - Total paper submitted: 15
 - Accepted: 7
- Thanks to all the reviewers. All the authors have received detailed review comments and suggestions
- Willing to be a reviewer for PESGM2022? Please send a note to yannan.sun@Oncor.com

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

Panels in GM 2021

AMPS Total: 33, BDA: 6

- **Big data analysis of synchrophasor data: experience from the US (Academic Track) LIVE**
(Session chair: Nanpeng Yu)
- **Big data analysis of synchrophasor data: experience from the US (Industry Track) LIVE**
(Session chair: Nanpeng Yu)
- **Physics-informed machine learning for power system LIVE**
(Session chair: Hao Zhu)
- **Security and reliability leverage cloud computing for grid operation, planning, control & IoT LIVE**
(Session chair: Song Zhang)
- **Distribution system operations in the age of big data**
(Session chair: Anamika Dubey, Nanpeng Yu)
- **Advanced data analytics for probabilistic security assessment**
(Session chair: Yanli Liu)
- **Artificial intelligence to cope extreme natural events in power system**
(Session chair: Reza Arghandeh)

Date/Time for Panels

Distribution System Operations in the age of big data	Monday, July 26	Pre-recorded
Advanced data analytics for probabilistic security assessment	Monday, July 26	Pre-recorded
Artificial intelligence to cope extreme natural events in power system	Monday, July 26	Pre-recorded
Physics-informed machine learning for power system	Monday, July 26	1 PM to 3 PM
Security and reliability leverage cloud computing for grid operation, planning, control & IoT	Tuesday, July 27	8AM to 10 AM
Big data analysis of synchrophasor data: experience from the US (Academic Track)	Tuesday, July 27	10 AM to 12 PM
Big data analysis of synchrophasor data: experience from the US (Industry Track)	Tuesday, July 27	3 PM to 5 PM
Big Data Analytics Subcommittee Meeting	Monday, July 19	10 AM to 12 PM

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Panel Proposal Submission for 2022 GM

- Deadline for submitting a panel proposal:
September 3rd
- Proposal template will be sent to all registered attendees after this meeting
- 5 min presentation
 - Ming Dong

Volunteers Welcome!

- How to get involved with BDA subcommittee?
 - Email 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

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

