

IEEE PES Subcommittee on Big Data & Analytics

Chair: Dr. Yannan Sun, Oncor Electric Delivery

Past Chair: Dr. Le Xie, Texas A&M University

Vice Chair: Dr. Hung-Ming Chou, Dominion Energy

Secretary: Dr. Yang Weng, Arizona State University

Secretary-Elect: Dr. Ning Zhou, Binghamton University

7/19/2023

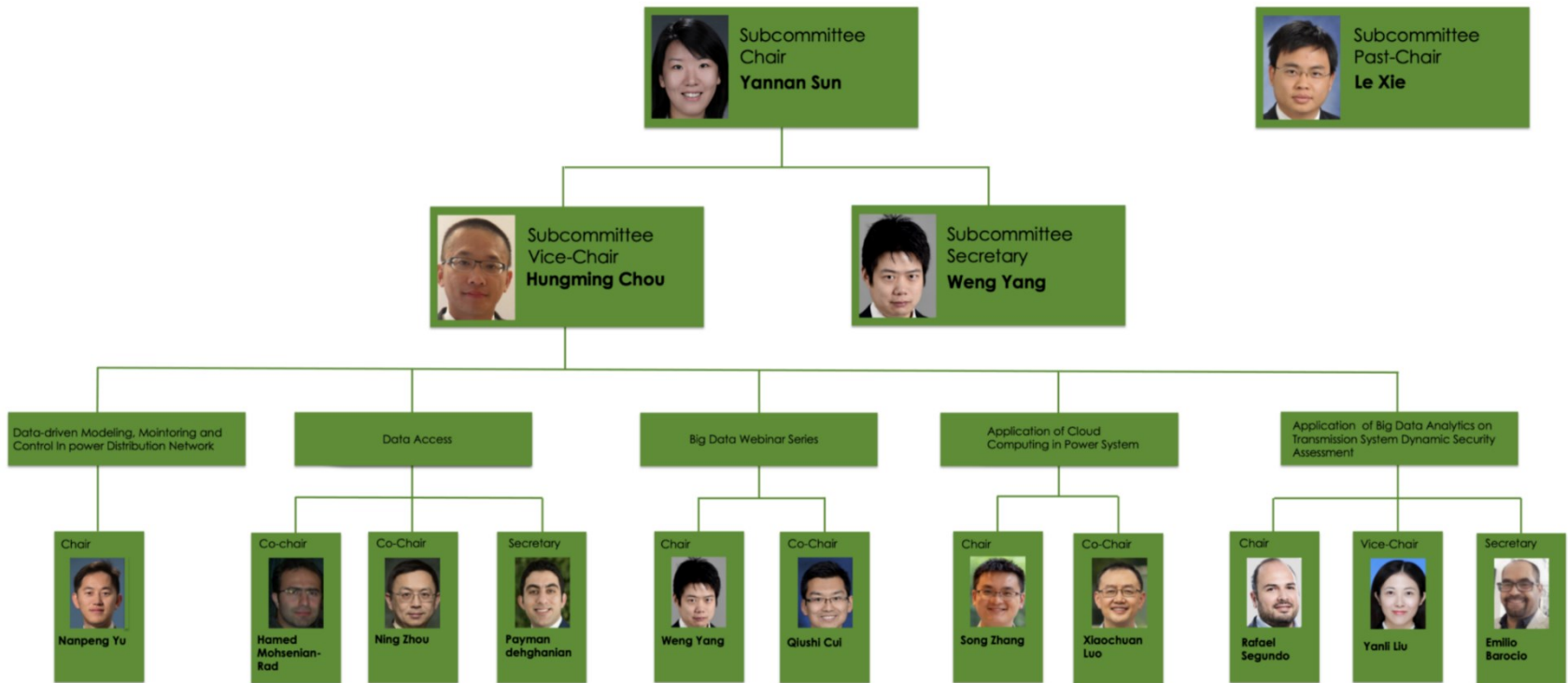


Agenda

- Welcome and Member Introduction
- Approval of 2022 Meeting Minutes
- Announcements
- Subcommittee Sponsored Activities for the Past Year
- TCPC Reports on GM2023 Papers and Panel Sessions
- Call for Panel Ideas for GM2024
- Open discussion



Subcommittee Structure



Data Sharing in Energy Systems: Yi Wang, Ricardo Bessa

Data Analytics for Energy Storage: Di Wu, Vinod Siberry

Big Data & Analytics in Power System Cybersecurity and Resilience: Jun Yan

Big Data Analytics for Synchro-Waveform Measurements: Hamed Mohsenian-Rad

<https://site.ieee.org/pes-bdaps/working-groups/>

Officer Rotation

- Past Chair: Dr. Yannan Sun, Oncor Electric Delivery
- Chair: Dr. Hung-Ming Chou, Dominion Energy
- TCPC: Dr. Yang Weng, Arizona State University
- Secretary: Dr. Ning Zhou, Binghamton University

Big Data & Analytics Subcommittee: Mission

The BDA subcommittee focuses on developing and advancing data-driven analytics for power grid planning and operation.

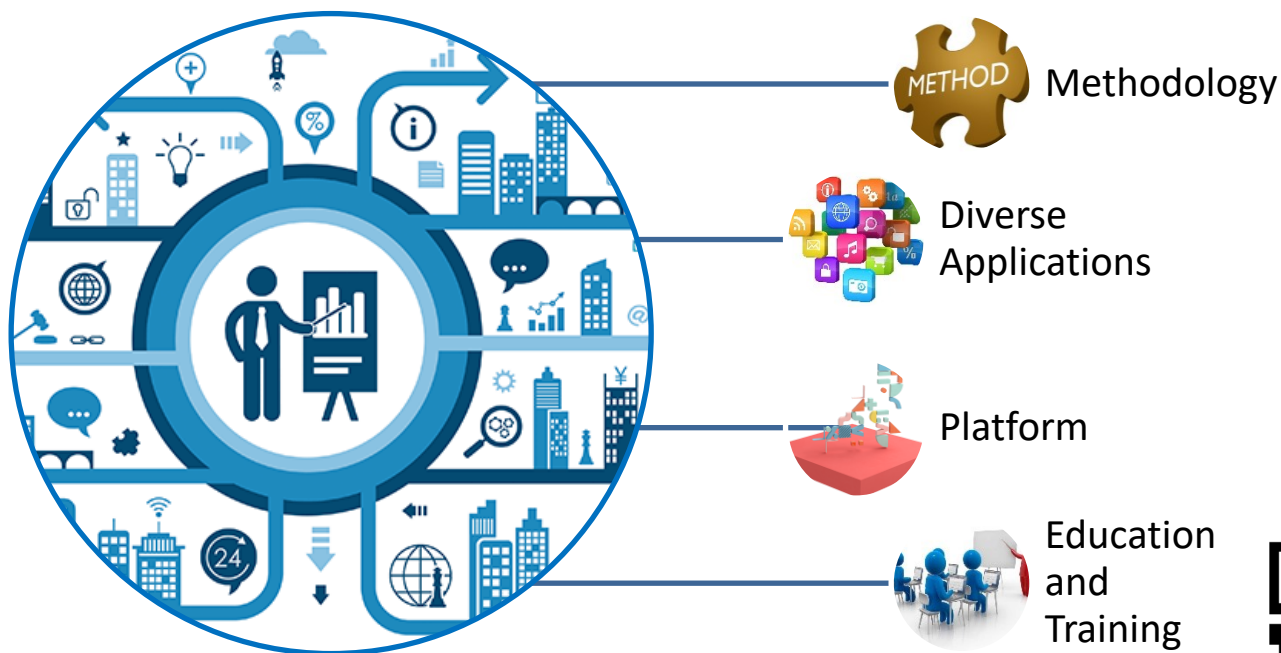
In particular we analyze “big” datasets---those data with at least one of: large volume, high velocity, diverse variety, and high veracity.

We seek to amplify impact through deep collaborations among academia, industry, and regulatory agencies by promoting data-driven solutions of real-world problems.



Value Proposition

Big Data & Analytics for Smart Grid



A Trajectory of Growth and Impact

Year	Milestones	Panels	Participants
2012-2013	TF on Big Data established	49	2800+
2015	Panels at PESGM		
2016	BDA Subcommittee Established		
2017	1 st BDA Webinars and Big Data Workshop		
2018	1 st Super Session at PESGM		
2017-2021	3 TFs, 2 WGs		
2022	2 TFs promoted to WGs, 2 new TFs proposed		
2023	1 TF promoted to WG, 2 new TFs proposed		
2022-2023	2 times on PES Trend Tech Newsletters		

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Minutes from 2022 Meetings

Minutes for 2022 IEEE PESGM Big Data Analytics (BDA) Subcommittee Meeting July 20, 2022 In Person

1. Introduction

Yannan introduced the subcommittee and reviewed the meeting agenda

2. Reinroduce the subcommittee

- Value proposition: methodology, diverse applications, platform, and education/training
- A trajectory of growth and impacts: 2012 - 2022
 - 2019 - Distribution working group, 2020 - 2021: 3 TFs and 2 WGs, 2022: 2 TFs promoted to WGs
 - 2016 – 2022: 44 panels and 2500+ participants

3. Approval of minutes from the 2021 meeting

Hung-Ming Chou moved, Yang Weng seconded. Members voted in favor of approving the 2021 meeting minutes. Special thanks to past chair Le Xie.

4. Announcements/summary

- Subcommittee website is updated with a new design
 - Home: introduction
 - Website structure
 - Archived activities
 - Data access
 - Feedback page
- Meetings
 - Add past leads from panels to the core team meeting
 - Public meeting: Increase from once a year to twice a year
- Task force changes
 - BDA webinar: TF to WG
 - Application of big data analytics on transmission system dynamic security assessment: TF to WG
 - New TF: Continuation of data access effort
 - New TF: Data analytics for energy storage
- TCPC announcement
 - PESGM 2023: July 16-20, Orlando, FL
 - Tutorial proposals: 9/6/22
 - Panel submission deadline: 8/28/22
 - Paper submission deadline: 11/21/22
- Report from WG/TF
 - Data-driven Modeling, Monitoring and Control in Power Distribution Networks WG (new in 2020, Nanpeng Yu)
<https://intra.ece.ucr.edu/~myu/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)
- Application of Cloud Computing in Power System Technical Report: Practical Adoption of Cloud Computing in Power Systems- Drivers, Challenges, Guidance, and Real-world Use Cases
- Presentations of New Task forces
 - Data sharing in energy systems - Continuation of the Data Access effort
 - Data Analytics for Energy Storage
 - Mission: Using advanced data analytics to assist energy storage planning and operation, and thereby advance the development and deployment of energy storage
 - Tasks:
 - Identify data needs and availability for energy storage modeling and analytics
 - Review existing data analytics methods and tools
 - Identify practical challenges and opportunities
 - Expected outcomes:
 - Survey report
 - Contribute to Data Access service of BDA Subcommittee

5. TCPC reports on GM2022 papers and panel sessions

- 2022 Papers for PES Gm
 - Total paper submitted: 42
 - Thanks to all the reviewers. All the authors have received detailed review comments and suggestions
 - Willing to be a reviewer for PESGM2023? Please send a note to Hung-Ming.Chou@dominenergy.com
- AMPS Total: 40, BDA: 10
 - Learning to Predict, trade and operate in the electricity market
Monday 3-5pm (Session chair: Nanpeng Yu, Hao Zhu)
 - Pushing distribution grid analytics to the edge: opportunities, challenges and best practices
Tuesday 8-10am (Session chair: Nanpeng Yu)
 - Big Data and AI Applications for Enhanced Power Grid Security and Reliability
Tuesday 8-10am (Session chair: Rui Fan)
 - Event Characterization Using Synchrophasor Big Data
Tuesday 10-12 am (Session chair: Mladen Kezunovic)
 - Data-Driven State and Parameter Estimation in Power Distribution Systems
Tuesday 10-12am (Session chair: Yuzhang Lin, Nanpeng Yu)
 - Enhancing power system operation through online analytics
Tuesday 1-3pm (Session chair: Panagiotis Papadopoulos, Stephen McArthur)
 - Using Data Analytics to Improve Energy Storage Modeling, Dispatch, and Valuation
Tuesday 3-5pm (Session chair: Di Wu)

- Data collection and future needs to account for the continuous growth of sensing data in control rooms
Thursday 8-10am (Session chair: Jochen Cremer, Segundo Rafael)
- Testbed and Dataset for Machine Learning Applications in Power Systems
Thursday 10-12am (Session chair: Nanpeng Yu)
- Data challenges and analytical system requirement for distribution grids with high solar penetration
Thursday 3-5pm (Session chair: Bo Yang)

6. Future activities

- Add subcommittee meeting attendees to BDA member email list
- Upload final meeting slides and meeting minutes to BDA webpage
- Send a final email to all BDA members capturing the following items:
 - Thank everyone who attended BDA subcommittee meeting
 - Slides and meeting minutes are available on BDA website
 - Deadlines for submitting panel proposals with a proposal template
 - Feedback and suggestions can be submitted on BDA website



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1. Task Force Changes

Task Force: Application of Cloud Computing in Power Systems

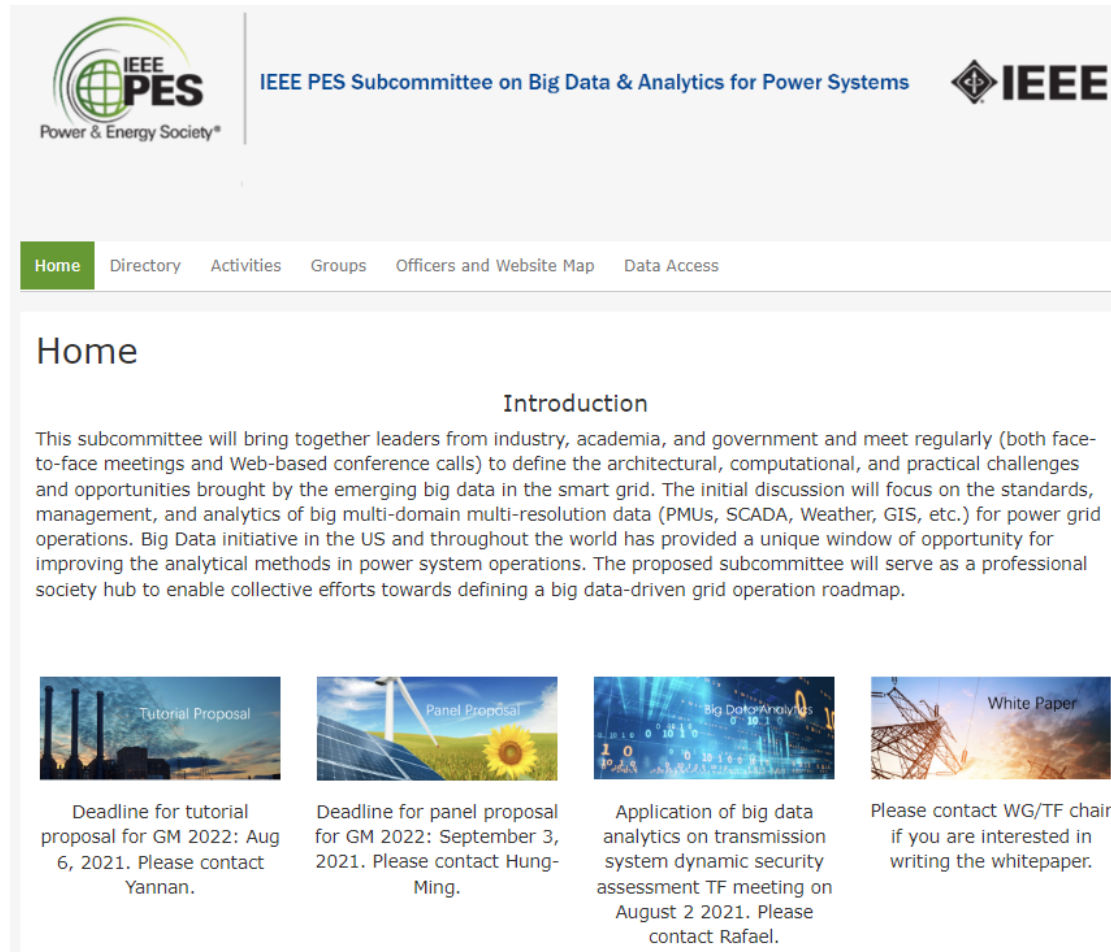
- **Promoted** to Working Group on Cloud for Grid Modernization and Digital Transformation

New task forces approved by AMPS

- Big Data & Analytics in Power System Cybersecurity and Resilience
- Big Data Analytics for Synchro-Waveform Measurements

2. Keeping BDA website update to date

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



IEEE PES
Power & Energy Society®

IEEE PES Subcommittee on Big Data & Analytics for Power Systems


IEEE

Home Directory Activities Groups Officers and Website Map Data Access


Home

Introduction


This subcommittee will bring together leaders from industry, academia, and government and meet regularly (both face-to-face meetings and Web-based conference calls) to define the architectural, computational, and practical challenges and opportunities brought by the emerging big data in the smart grid. The 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. Big Data initiative in the US and throughout the world has provided a unique window of opportunity for improving the analytical methods in power system operations. The proposed subcommittee will serve as a professional society hub to enable collective efforts towards defining a big data-driven grid operation roadmap.




Deadline for tutorial proposal for GM 2022: Aug 6, 2021. Please contact Yannan.



Deadline for panel proposal for GM 2022: September 3, 2021. Please contact Hung-Ming.



Application of big data analytics on transmission system dynamic security assessment TF meeting on August 2 2021. Please contact Rafael.



Please contact WG/TF chair if you are interested in writing the whitepaper.

3. Technical Trend for IEEE

- August 2023 – Applying big data and analytics for power systems
- Info needed: (Please send to Dr. Ning Zhou)
 - Active TF/WG of interest: upcoming event/meeting details
 - Technical Reports & Applicable Papers or Presentations
 - Publications
 - Other available material (webinars, tutorials, workshops, presentations, etc.)
- Great venue to publicize your work
- <https://www.ieee-pes.org/technical-activities/trending-technologies>

4. Core Team Members and Bi-Annual Meetings

Core Team Members

- Past: Chairs from Subcommittee, WG, and TF
- Now: Including Panel Chairs

Public Meetings

- Past: Once a Year at the PESGM
- Planning: Twice a Year – GM and Virtual



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

TCPC announcement

- PES GM 2024: July 21-25, Seattle, WA
- Tutorial proposals

2024 IEEE PES Innovative Smart Grid Technologies Conference, North America (ISGT NA) – 31 July 2023
2024 IEEE PES Transmission & Distribution Conference & Expo (T&D) – 31 July 2023
2024 IEEE PES General Meeting – 11 September 2023

- Panel submission deadline: 8/28/22 (Template will be sent out after this meeting)
- Paper submission deadline: 11/8/23
- Super Session topic recommendation for PES GM 2025:
March, 2024

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Report from TF/WGs

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[website](#)
- Big Data Webinar Series WG
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- Cloud for Grid Modernization and Digital Transformation WG
[website](#)
- Big Data & Analytics for Transmission Systems WG
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- Data Sharing in Energy System TF
- Data Analytics for Energy Storage TF
- Big Data & Analytics in Power System Cybersecurity and Resilience TF
- Big Data Analytics for Synchro-Waveform Measurements TF

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GM2023 Papers

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 - Total paper submitted: 20
 - Accepted: 10
- Thanks to all the reviewers. All the authors have received detailed review comments and suggestions
- Willing to be a reviewer for PESGM2024? Please send a note to hmchou@ieee.org

Panels in GM 2023

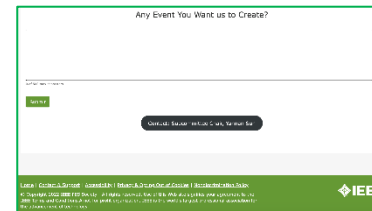
AMPS Total: 20, BDA: 5

Panel Title / Chairs	Time/Location
Synchrophasor Data Analytics Kaveri Mahapatra, Nanpeng Yu	Tue (July 18), 8:00AM – 10:00 AM, Celebration 16
Public Data Repositories for Power Systems Operation and Machine Learning Applications Jhi-Young Joo	Wed (July 19), 8:00AM -10:00AM, Celebration 9
Application of Big Data and AI/ML in monitoring, operations, planning and protection Mladen Kezunovic, Rafael Segundo	Wed (July 19), 10:00AM -12:00PM Celebration 5
Big Data for Enhanced Grid Performance with Considerations of Data Barriers and Privacy Rui Fan, Yi Wang	Thu (July 20), 8:00AM -10:00AM Celebration 3
Machine Learning Applications in Power Distribution System Operation Ning Lu, Vassilis Kekatos	Thu (July 20), 1:00PM – 3:00PM Celebration 3

Volunteers Welcome!

- How to get involved with BDA subcommittee?

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



- Please mention what initiative(s) you are interested.

- Interested in reviewing papers?

Please contact TCPC at

hung-ming.chou@dominionenergy.com



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