

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

7/20/2022



Agenda

- Welcome and Member Introduction
- Approval of 2021 Meeting Minutes
- Announcements
- Subcommittee Sponsored Activities for the Past Year
- TCPC Reports on GM2022 Papers and Panel Sessions
- Call for Panel Ideas for GM2023

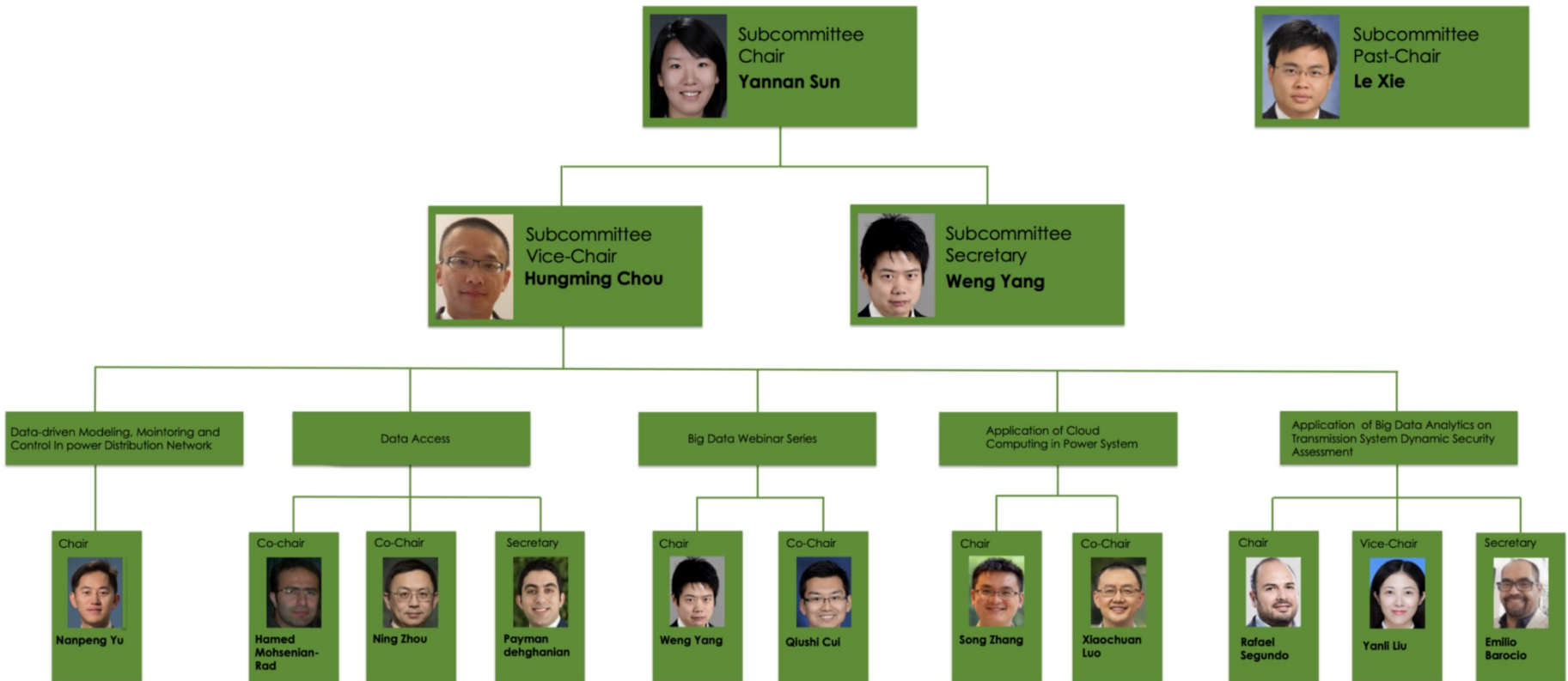


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Subcommittee Structure



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

Big Data & Analytics Subcommittee: Mission

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

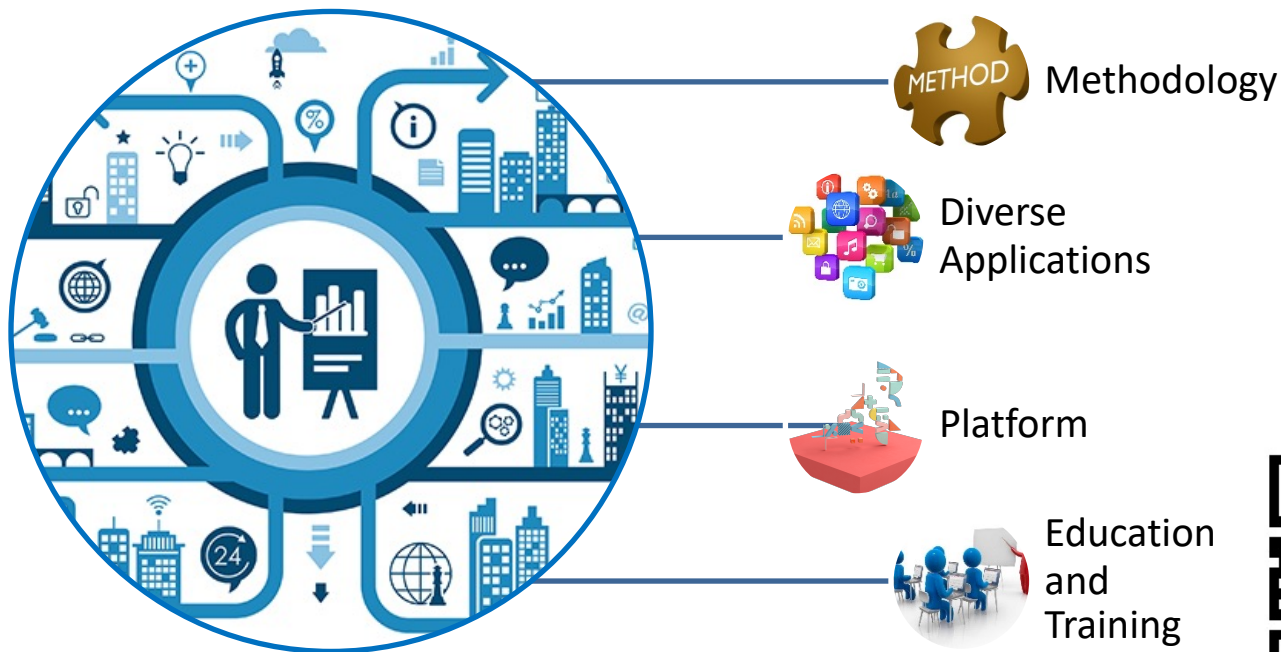
In particular we analyze “big” datasets---those data with at least one of: large volume, high velocity, diverse variety, and high veracity.

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	44	2500+
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		
2022	2 new TFs proposed		

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Minutes from 2021 Meetings

Draft minutes for 2021 IEEE PESGM Big Data Analytics (BDA) Subcommittee Meeting
July 19, 2021
Virtual

1. Introduction

Le Xie introduced the subcommittee and reviewed the meeting agenda

2. Approval of minutes from the 2020 meeting

Yannan Sun moved, Yang Weng seconded. Members voted in favor of approving the 2020 meeting minutes

3. Announcements/summary

- Subcommittee website is established and linked with AMPS website
- Officer transition: Yannan Sun serves as chair, while Hung-Ming Chou serves as TCPC/vice chair
- TCPC announcement
 - Next year GM is in Denver, CO, in person
 - Deadline for the tutorial proposal is on Aug 6
 - Send the panel proposal to Hung-Ming
- Papers statistics: total paper submitted: 15, accepted: 7. Thanks for all the reviewers for their help.
- NSF Program manager provided update
- Activities from last year
 - Organize annual workshop on grid resiliency, more than 600 participants
 - Videos/presentations are available on IEEE Smart Grid Resource Center
- Report from WG/TF
 - Big data application in power distribution system TF
 - Big data webinar series TF
 - Application of big data analytic on transmission system dynamic security assessment
 - Cloud computing for power grid operation, planning, monitoring and control TF
- Panel session chairs provided updates on the BDA sponsored panels at 2021 PES GM:
 - **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)

4. Proposed 2022 GM panel session

- It is highly encouraged to contact with other subcommittees for panel slot
- Please submit the panel proposal to subcommittee. Subcommittee will ask members to vote to rank the proposals
- Panel proposal presentation
 - Ming Dong
 - Nanpeng
 - Lina He
 - Kevin Chen

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

6. Future activities

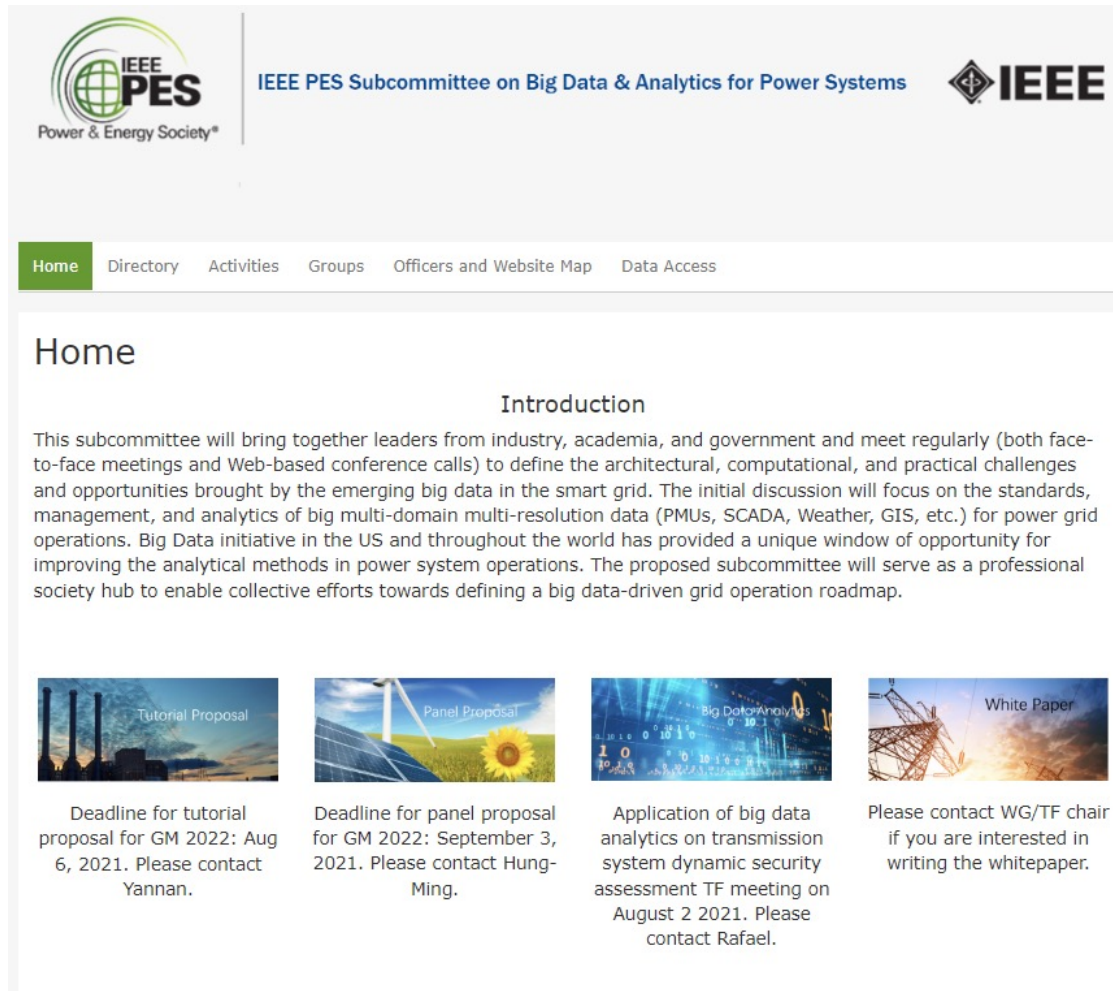
- Currently the BDA core team consists of Chair, Vice-chair, Secretary, TF leaderships, and IEEE Big Data liaison, the core team will met bi-weekly or quarterly for subcommittee activities.
- Will host annual workshop on the big data analytics for smart grid community. We will need volunteer|

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1. Updated Website Established and Linked with AMPS



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.




Tutorial Proposal

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




Panel Proposal

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



Big Data Analytics

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



White Paper

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

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

1. Updated Website: Site Structure



IEEE PES Subcommittee on Big Data & Analytics for Power System

Home Page

- Introduction
- Upcoming Event
- Big Data webinar
- Form submission
- Contact button

Directory

- Subcommittee Map
- Subcommittee meeting
- Presentations

Activities

- Upcoming activities
- Past activities
- PES general meeting

Groups

- Working groups
- Task forces

Officers and Website Map

- Chair
- Vice-Chair
- Past-Chair
- Secretary
- Website map

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

1. Updated Website: Archived Activities

IEEE.org | IEEE Xplore Digital Library | IEEE Standards | IEEE Spectrum | More Sites

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IEEE PES Subcommittee on Big Data & Analytics for Power Systems

Home Directory **Activities** Groups Officers and Website Map Data Access

Activities

Upcoming Activities

Webinar Series on Big Data & Analytics for Power Systems. ([Link](#))

2021 PES General Meeting
Subcommittee Meeting

Predictive Big Data Analytics for Outage Management		Monday, August 3	
Artificial Intelligence and the Future of Distribution Management systems		Monday, August 3	
Integration of Various Source Data for Enhanced Situation Awareness of Power System		Tuesday, August 4	
Learning to Model, Monitor, and Control Power Distribution Systems		Tuesday, August 4	
Advanced-Data Analytics for Power Asset Management		Tuesday, August 4	
Learning to Optimize Power Transmission Systems		Thursday, August 6	
Observability and Controllability of Power Distribution System in Big Data Era		Thursday, August 6	
Big Data Analytics Subcommittee Meeting		Monday, August 10	

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
Data analytic tools for dynamic security assessment of bulk power systems	Room 312	Tuesday, August 6	10:00 to 12:00
Big data application in power system distribution system TF	Room 405	Tuesday, August 6	15:00 to 16:00
Big data webinar series TF	Room 405	Tuesday, August 6	13:00 to 14:00
Big data access WG	Room 405	Tuesday, August 6	14:00 to 15:00
Big Data & Analytics Subcommittee	Galleria 3	Wednesday, August 7	15:00 to 17:00

2018 PES General Meeting (Panel Session)

Panel session: Big data analytics for emerging power sensors and internet-of-things. (Session chair: Hamed Mohsenian-Rad, Emma Stewart)

Deep data from optical sensors	(slide)
The advent of the "One Second Home"	(slide)
Time series data at scale	(slide)

Panel session: Big data analytics focus on end-use customers in power distribution systems. (Session chair: Nanpeng Yu, Haiwang Zhong)

Nonintrusive load modeling: advanced monitoring	(slide)
Data-driven residential solar power forecasting	(slide)
EnergyCoupon	(slide)

Panel session: Big data analytics for flexible electricity network, market, and prosumers. (Session chair: Ran Li, Tao Hong)

Panel session: Best practices in sharing big data in power systems. (Session chair: Ning Zhou, Hamed Mohsenian-Rad)

Panel session: Smart meters: from consumer behavior to planning. (Session chair: Ram Rajagopal)

Panel session: High-performance computing and big data analytics for large scale power system planning problems. (Session chair: Dimitri Papageorgiou, Yingzhong Gu)

2017 PES General Meeting (Panel Session)

Big Data Access and Big Data Research Integration in Power Systems. (Panel Session Chair: Dr. Hamed Mohsenian-Rad)

Opening Remarks	(slide)
System Identification of Reduced-Order Models of Power Systems from PMU Data	(slide)
Advanced Analytics and Data for PMU Applications	(slide)
Open Micro-PMU: A Real World Reference Distribution Micro-phasor Measurement Unit Data Set for Research and Application Development	(slide)
Big Data Access, Analytics and Sense-Making	(slide)
Predictive Analytics for Energy Systems State Estimation	(slide)

Big Data Analytics for Electricity Markets. (Panel Session Chair: Dr. Ran Li, Dr. Li Furong)

Empowering Renewable Energy Prosumers through Big Data Analytics	(slide)
Big Data Analytics to Facilitate DSO Transition	(slide)
Network Pricing in the Low Carbon Power Markets	(slide)
Market Integration Between Wholesale and Retail Markets	(slide)
Mutual Trading Strategy between Customers and Power Generations based on Load Consuming Patterns	(slide)
Consequences of Climate Change into Decision Making for Energy Market	(slide)
Low Voltage Customer Characterization Options for Distribution Pricing and Demand Side Management	(slide)
Research Trends in Load Forecasting and Their Implications to Energy Trading	(slide)
Renewable Energy Trading in Cross-Region Power Market of China	(slide)
Open Micro-PMU: A Real World Reference Distribution Micro-phasor Measurement Unit Data Set for Research and Application Development	(slide)

Big Data for Integrated Energy Systems. (Panel Session Chair: Dr. Goran Strbac, Dr. Bie Zhaozhong)

Real-Time Outage Detection from Utility Big Data	(slide)
Research on the Framework and Data Fusion of an Energy Big-data Platform	(slide)
Big Data Analysis for Energy Internet	(slide)
Data-Driven Load Model	(slide)
Extracting Value from Smart Grid to Support Peer-to-Peer Energy System	(slide)
Understanding and Characterising the Dependence of Electricity on Gas with Big Data	(slide)
Open Micro-PMU: A Real World Reference Distribution Micro-phasor Measurement Unit Data Set for Research and Application Development	(slide)

Big Data in Power Systems: Transmission, Distribution, and Data Analytic Applications. (Panel Session Chair: Dr. Mladen Kezunovic, Dr. Nanpeng Yu)

2016 PES General Meeting (Panel Session)

Panel Session on "Big Data on Power Distribution Networks". (Panel Chair: Dr. Reza Arghandeh)

Panel Session on "Big Data on Demand Response". (Panel Chair: Dr. Haiwang Zhong)

2015 PES General Meeting (Panel Session)

Panel Session on "Using Big Data to Enhance Transmission System Planning and Operations". (Panel Chair: Dr. Jun Wen) Wednesday July.29.2015.

"Stop the Data Flood" by Dr. Anthony Johnson.
"Synchrophasor-based Big Data Analytics for Grid Operations and Planning" by Dr. Manu Parashar.
"Predictive Analytics Derived from HVAC and PMU Data, Case Histories at UCSD" by Dr. Chuck Wells.
"Application of Synchrophasor Data to Power System Operations" by Prof. Joe Chow.

2014 PES General Meeting (Panel Session)

Panel discussion on "Challenges and Solutions of Big Data for Power System Operations". Tuesday July.29.2014 (10am-noon, Azalea 2)

Panel discussion on "CAMS Task Force Big Data-Driven Analytics for Smart Grid Operations". Tuesday July.29.2014 (2 pm in Potomac 5)


2013 PES General Meeting


2013 PES GM (Panel Discussion and Kickoff Task Force Meeting).

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

2. Data Access Page Integrated

IEEE.org | IEEE Xplore Digital Library | IEEE Standards | IEEE Spectrum | More Sites


IEEE PES
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IEEE PES Subcommittee on Big Data & Analytics for Power Systems 

Home Directory Activities Groups Officers and Website Map **Data Access**

Data Access

1. Smart Meter Energy Research Project – UK
2. Solar Power Data for Integration Studies – USA
3. NYSERDA Distributed Energy Resource (DER) Dataset – USA
4. Distribution PMU Data Set
5. VSB Power Line Fault Detection Data
6. Electric Vehicle Mobility Data Set
7. High-Resolution Solar Radiation Data Set
8. Texas Residential Smart Meter Data Set
9. NREL Solar Radiation Data Set
10. Belgium Solar PV Power Generation Data Set – Belgium
11. Commercial and Residential Hourly Load Data Set
12. Smart Meter Electricity Trial Data Set
13. Humboldt State University (SoRMS) Radiation Data Set
14. University of Oregon (SRML) Radiation Data Set
15. California ISO Load Data Set
16. New York ISO Load Data Set
17. ERCOT Load Data Set
18. ISO New England Load Data Set
19. Synthetic PMU Data Set
20. EPFL Campus PMU Data Set
21. Midcontinent ISO Load Data
22. Solar Radiation Data Set
23. Wind Power Generation Data Set – Belgium
24. DKASC Solar Power Data Set – Australia
25. Rooftop Solar Data Set – Australia
26. Solar Radiation Data Set – USA
27. New Jersey State Load Data Set
28. Weather Data Set – Worldwide

29. Solar Generation Data Set – Worldwide
30. Alberta Electric System Operator (AESO) Load Data Set
31. Smart Meter Data Set – Ireland
32. Wind Speed Data Set – USA
33. LBNL Micro-PMU Data Set – USA
34. AEMO Australian Electricity Market Data Set – Australia
35. MesoWest Weather Data Set for Wind and Solar Integration
36. The Reference Energy Disaggregation Data Set
37. Household Load Profile Generator
38. UK Domestic Appliance-Level Electricity (UK-DALE) Data Set
39. EPRI Load Shape Library
40. The Almanac of Minutely Power Data Set
41. Private Home Electricity Consumption 1
42. Private Home Electricity Consumption 2
43. Private Home Electricity Consumption 3
44. Private Home Electricity Consumption 4
45. Private Home Electricity Consumption 5
46. Private Home Electricity Consumption 6
47. Private Home Electricity Consumption 7
48. Private Home Electricity Consumption 8
49. Private Home Electricity Consumption 9
50. Private Home Electricity Consumption 10
51. Office Electricity Consumption 1
52. Office Electricity Consumption 2
53. Office Electricity Consumption 3
54. Office Electricity Consumption 4
55. Commercial Electricity Consumption
56. Refrigerator Electricity Consumption
57. Water Heater Electricity Consumption
58. Electric Vehicle Database 1
59. Electric Vehicle Database 2
60. Power Quality Database
61. Summer PV Generation Data Set – Brazil
62. Winter PV Generation Data Set – Brazil
63. PV Generation Data Set
64. Wind Generation Data Set

Description

High-Resolution Solar Radiation Data.

Data Types

Solar Radiation Data

Categories

Solar Radiation Data

Format

CSV

Sampling Intervals

1-Second

Starting Time (Year)

2014

Time Duration

Several Days

Total Size

1 GB

Geographic Location

Ontario and Quebec (Canada)

Geographic Resolution

State-Wide

Access Tools

Website: National Resources of Canada

Data URL

Data

User Manual

Data

Keywords

- Solar Radiation Data
- Solar Farm
- High-Resolution Solar Data

<https://site.ieee.org/pes-bdaps/data-access/>

3. Ideas and Feedbacks to the Subcommittee

Any Event You Want us to Create?


0 of 500 max characters

Submit

Contact: Subcommittee Chair, Yannan Sun

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4. Core Team Members and Bi-Annual Meetings

Core Team Members

- Past: Chairs from Subcommittee, WG, and TF
- Future: Add Past Leads from Panels

Public Meetings

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

Virtual and Get More People in the Loop

5. Task Force Changes

Task Force: BDA Webinar

- **Promoted** to Working Group

Task Force: Application of Big Data Analytics on Transmission System Dynamic Security Assessment.

- **Promoted** to Working Group on Big Data & Analytics for Transmission Systems

New Task Forces to be proposed

- Continuation of Data Access Effort
- Data Analytics for Energy Storage

Special Thanks to Past Chair Dr. Le Xie

TCPC announcement

- PES GM 2023: July 16-20, Orlando, FL
- Tutorial proposals: 9/6/22

IEEE PES 2023 Call For Tutorials

Deadline for submissions - Monday, 6 September 2022

The IEEE Power & Energy Society invites proposals for tutorials in conjunction with the following 2023 PES Conferences.

- IEEE Innovative Smart Grid Technologies – North America (ISGT-NA) – 16 to 19 January – Washington, DC, USA – “Moving to a Self-Driving Grid” - <https://ieee-isgt.org/>
 - IEEE PES Grid Edge Technologies Conference and Exposition - 10 to 13 April - San Diego, CA, USA – “Transform the Edge” - <https://pes-gridedge.org/>
 - IEEE PES General Meeting – 16 – 20 July - Orlando, FL, USA – “Meeting the Energy Needs of a Dynamic World” - <https://pes-gm.org/>
- Panel submission deadline: 8/28/22
 - Paper submission deadline: 11/21/22

<https://www.ieee-pes.org/17-meetings-conferences/calls-papers>

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Report from TF/WGs

- Data-driven Modeling, Monitoring and Control in Power Distribution Networks WG
<https://intra.ece.ucr.edu/~nyu/IEEE%20PES%20WG.html>
- Big Data Webinar Series TF
<https://www.public.asu.edu/~yweng2/Tutorial5/>
- Application of Cloud Computing in Power System TF
<https://sites.google.com/view/cloud4powergrid/>
- Application of Big Data Analytics on Transmission System Dynamic Security Assessment TF
<https://www.zhaw.ch/en/engineering/institutes-centres/iefe/energy-storage-and-energy-grids/electric-power-systems-and-smart-grids/task-force-application-of-big-data-analytic-on-transmission-system-dynamic-security-assessment/>

IEEE Power and Energy Society

Working Group Meeting

Data-Driven Modeling, Monitoring, and Control in Power Distribution Networks

Nanpeng Yu, Associate Professor

Department of Electrical and Computer Engineering

University of California, Riverside

Email: nyu@ece.ucr.edu

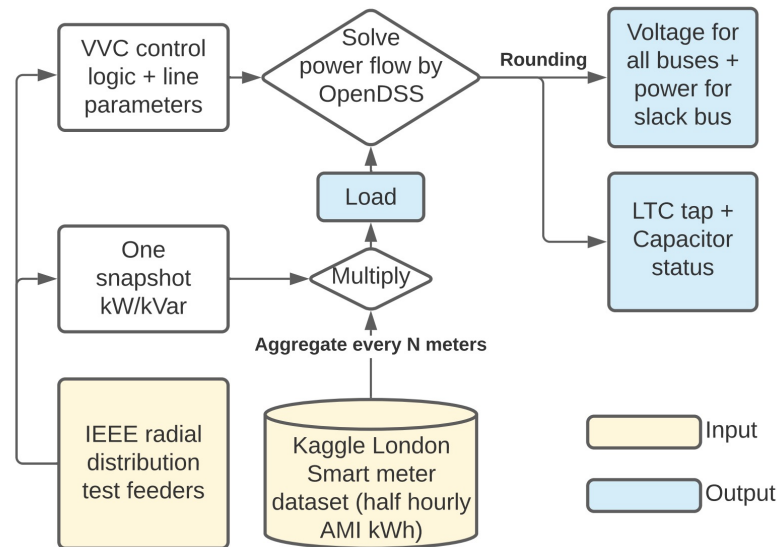
Website: <https://intra.ece.ucr.edu/~nyu/>

Activities from Last Year

- 2022 PES GM Panel Session
 - Data-Driven State and Parameter Estimation
 - Tuesday 10 am – 12 pm
 - Attendance: 50
 - 5 Speakers
 - State and parameter estimation
 - Inverter-connected renewable resource estimation
 - Testbed and Dataset for Machine Learning Applications in Power Systems
 - Thursday 10 am – 12 pm

Activities from Last Year

- › Gym Environment for Data-Driven (RL-based) VVC
 - › Yuanqi Gao, https://github.com/yg-smile/RL_VVC_dataset
 - › Yubo Wang, <https://github.com/siemens/powergym>



Tasks Group: Data-Driven Control in Power Distribution Systems

- › Held a virtual meeting to discuss plans to prepare a technical report on data-driven control in power distribution systems
- › 60% complete
- › Control applications identified
- › Algorithms summarized
- › Plan to meet virtually in August
- › Looking for Volunteers

Planned Activities

- › Panel Session Proposal for GM 2023
- › Technical Report for Task Group
 - › Data-driven topology and parameter estimation in power distribution systems

IEEE PES Subcommittee on Big Data & Analytics for Power Systems

Big Data Webinar Working Group Report

2022 IEEE PES-GM
Denver, CO

- Presenter: Qiushi Cui, Yang Weng, Zhuoheng Wang

Introduction-Summary of the Past Work

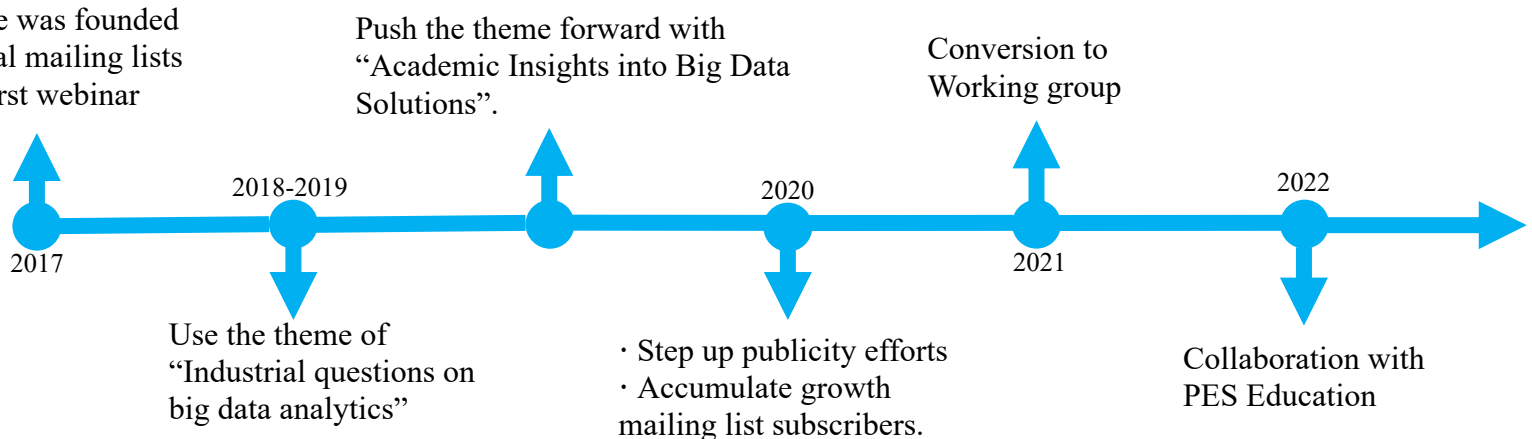


The original goal:

- Bring together leaders and luminaries.
- Improve the analytical methods in power system operations.
- Share innovations with professionals and educate students.

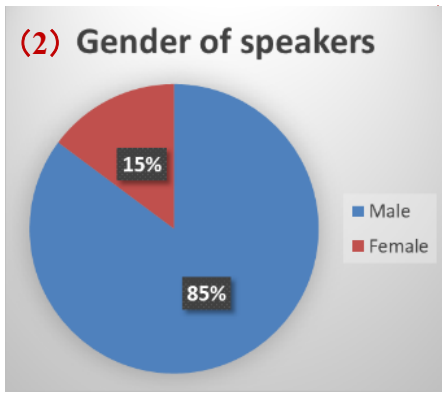
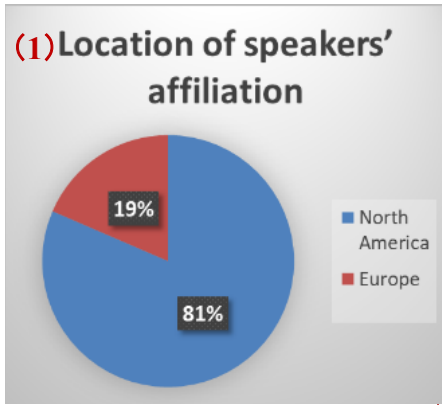
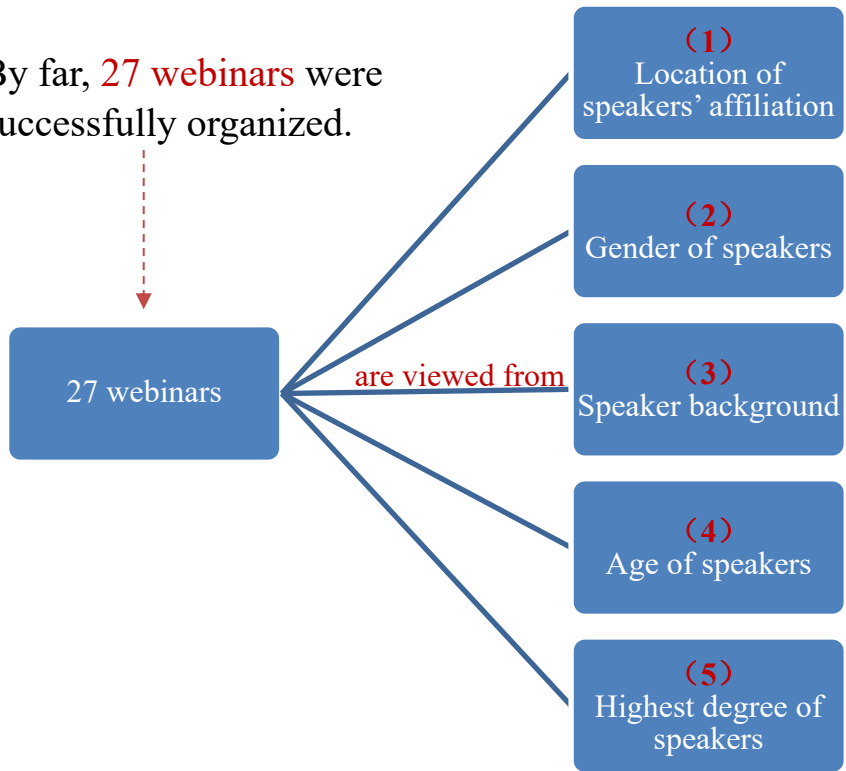
Summary of the past work:

- The task force was founded
- Collect several mailing lists
- Launch the first webinar



Current Status of the Task Force

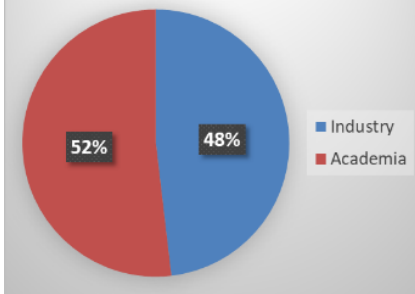
By far, 27 webinars were successfully organized.



Analysis: Non-North America and female speakers are playing an active role in our organized webinars.

Current Status of the Task Force

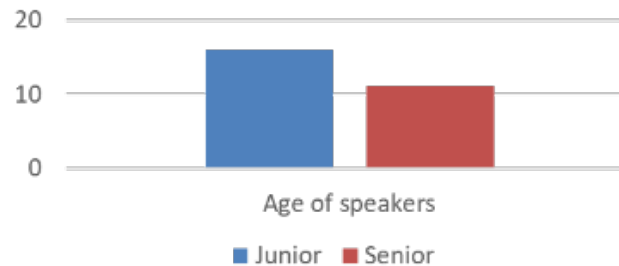
(3) Speaker background



Analysis:

Achieve a balance on speakers from industry and academia.

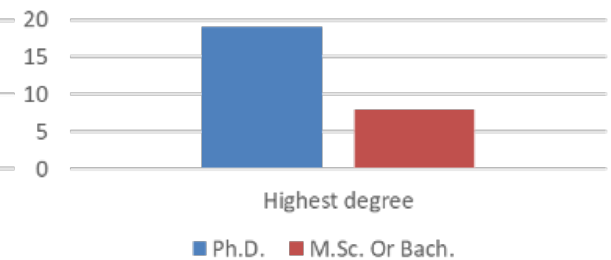
(4) Junior or Senior



Analysis:

Junior and senior researchers and engineers are both active in the field.

(5) Highest degree of speakers



Analysis:

The speakers with Ph.D. degree are more than two times of the ones with Master's degree.

The number of online audience:



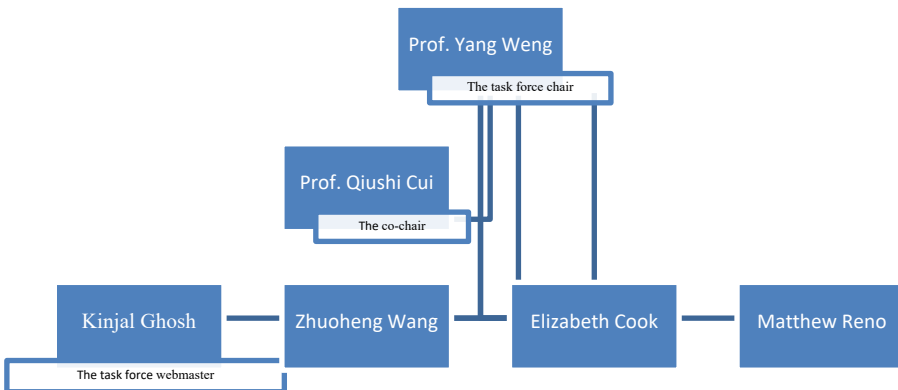
more than 50 people each time since December 2019



336 audience in April 2020

Current Status of the Working Group

Staff:



The subscription webpage:

- Upcoming webinars are presented and the past webinars are well documented.
- Provide the title, date, speaker bio and the abstract.
- Provide as well slides, open source code(if any), webinar videos and an offline Q&A section.

Latest webinar:

1. Learning and control in power distribution grids

17 March 23, 2022

🎤 Steven Low

Provided data and papers about EV charging.

2. Distributed Optimization, Prediction, and Privacy Presevation in Power Grids

17 March 14, 2022

🎤 Anuradha Annaswamy

Papers are frequently cited.

3. The Increasing Data Streams in Power Grid Operation

17 January 24, 2022

🎤 Anjan Bose

Provided research papers.

4. Low Voltage Data Analytics: Roadblocks, Challenges, and Future Opportunities

17 October 20, 2021

🎤 Peter Grindrod and Stephen Haben

Large audience numbers and high page views.

Innovative Ways to Recruit Speakers

- (1) **Promise a webpage** for each speakers, **create links** for the speaker's personal website, and list his/her publications.
- (2) Help the speakers **collect associated statistics** for funding application.
- (3) **Provide a support letter** for the speaker's proposal, educational impact and global sustainability
- (4) **Advocate** for the speakers on their future competition, tutorial, papers, etc.



To leverage innovative ways to recruit speakers

Achievement:

Our webinars have gained the popularity among the audience and were noticed by the IEEE PES officers.

Rationale Behind the Elevation Request

convert task force
to a working
group



Rationale

Big data analytical methods in grid operation are evolving rapidly

A growing need for information exchange

Develop a better learning platform for the audience

Turn passive information collection into active information delivery

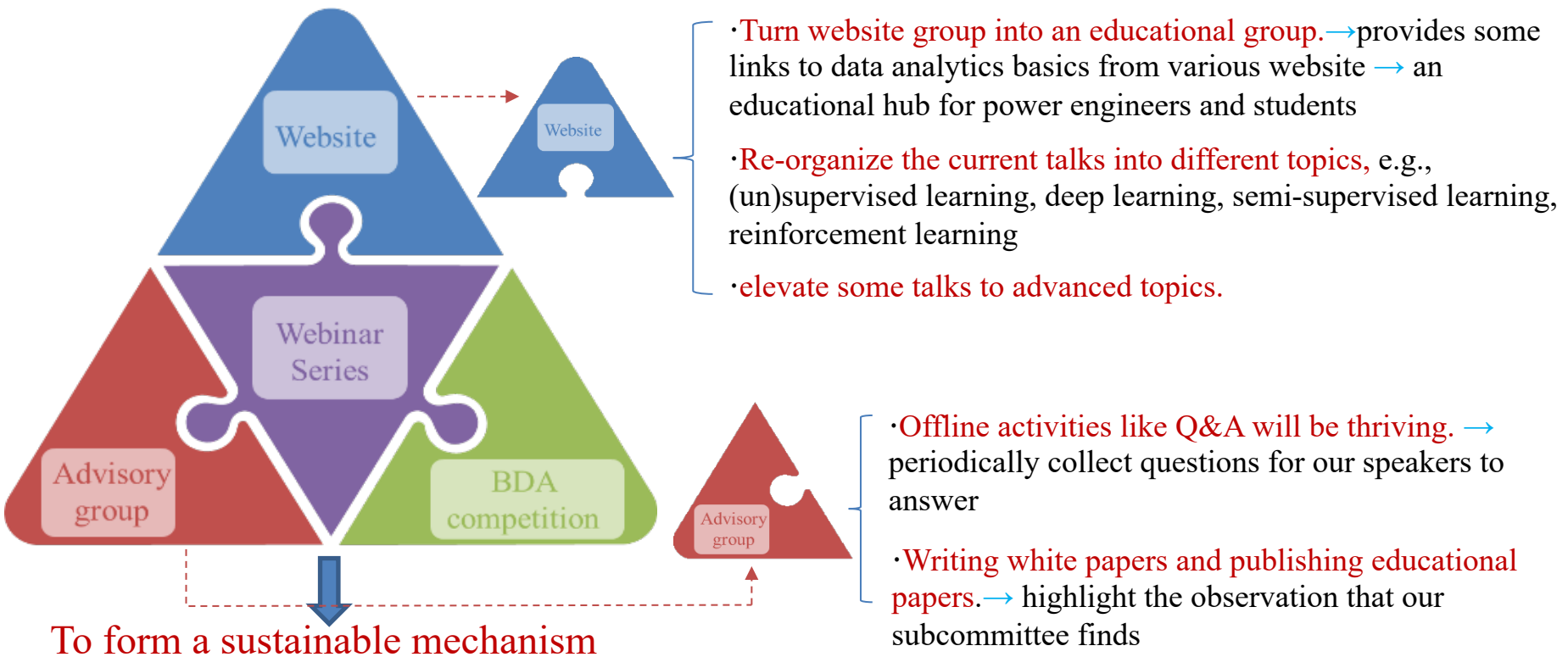
Bring more discussions offline

Boost the impact of the Big Data Subcommittee

Successful stories:

Power System Communications and Cybersecurity Committee move its S8 task force to a working group to develop a cybersecurity standard

Future Work Triangle



Organization Activities and Target Outlook

- What we are proud of ?

The assistance of data-power-based competitions. Currently, We are sponsoring the RTE international competition (Prof. Weng's group – 2nd place last year).

- what can we do ?

a) In order to sustain the learning environment, We turn passive learning into active learning.

b) Based on the RTE competition, We organize related webinars and tutorials.

c) We have different subarea topics for all by-products (philosophy, webpage, code).

- What will we do?

a) We create resource pages for students to learn data scientists' work to help power grid operations.

b) We let power engineers know more related opportunities to broaden their career view.

c) We reversely contact data-power companies to support the competitions we are proposing.

Preparation For The Asian BDA Tutorials

The preparation work:

1

Select well-known universities from countries in the Asia-Pacific region (China, Japan, South Korea, Australia, New Zealand, Singapore, etc.).

2

Connect with well-known professors and scholars in related fields of these universities.

3

Professors and scholars give lectures on the direction of big data and energy research.



Saifur Rahman
IEEE President
Research Interests:
Alternate energy; Smart grid
Uncertainty evaluation;
Environmental impacts

We plan to invite IEEE President Saifur Rahman to be our opening speaker, kicking off the first Asian-Pacific BDA tutorial.

• **Task Force on Application of Big Data Analytic on Transmission System Dynamic Security Assessment**

- **Officers**
 - **Rafael Segundo (Chair)**
 - **Yanli Liu (Vice-Chair)**
 - **Emilio Barocio (Secretary)**
 - **Petr Korba (Secretary)**
-
- **Subcommittee on Big Data & Analytics for Power Systems**

• Summary of Activities in Last Year

- **4 Task Force Virtual Meetings and 1 in presence meeting**
 - Oct 2021, Dec 2021, Feb 2022, May 2022 (Virtual Meetings)
 - July 18th, 2022 (during IEEE PES GM)
- **Sep 6th, 2021 International Workshop DynPOWER**
 - Virtual Event with 9 speakers and 450 registrations.
- **May 24th, 2022, Hybrid Panel Session**
 - *“Utilization of transmission system data for enhancement and preservation of its secure operation”*
 - 2 hours event during IEEE SGSM 2022 Conference, in Split, Croatia with 5 international speakers.
- **July 2022, Publication of the first technical report in the PES Resource Center (PES-TR100)**
 - *“Present situation on data acquisition, handling, and analytics of operators of the transmission system in different countries and their future needs to cope with the continuous growth of data”*
 - Survey of 11 TSOs from 9 countries

• Upcoming Activities

- **July 21th, 2022, Panel Session (8:00- 10:00 AM, Plaza Court 3)**
 - *“Data collection and future needs to account for the continuous growth of sensing data in control rooms”*
 - 2 hours event within the IEEE PES GM with 6 international speakers.
- **Sep 19th, 2022 International Workshop DynPOWER (free of charge)**
 - Hybrid event with 8 international speakers, registration and program to follow in official website:
[link to DynPOWER 2022](#)
- **Second technical report**
 - *“Application of data-driven, and machine learning algorithms for the secure operation of transmission systems”*
 - Contribution of 13 research groups, to be published before the end 2022
- **Last Task Force Virtual Meetings of 2022**
 - October 27th, 2022

- **Thank you for your attention**

Officers:

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TF: Application of Cloud Computing in Power System

The screenshot shows the homepage of the IEEE Task Force on Cloud Computing for Power Grid Operation, Planning, Monitoring and Control. At the top, a blue banner contains the text "New!!! The Task Force has released a technical report on practical cloud adoption" and a "View Report" button. Below this is a dark navigation bar with the "Cloud For Power Grid" logo on the left and menu items: "Home", "Motivation", "Team", "Schedules", "Partnership", "Sharing", and a search icon. The main content area features a background image of power lines and a network overlay, with the text "IEEE Task Force on Cloud Computing for Power Grid Operation, Planning, Monitoring and Control" centered.

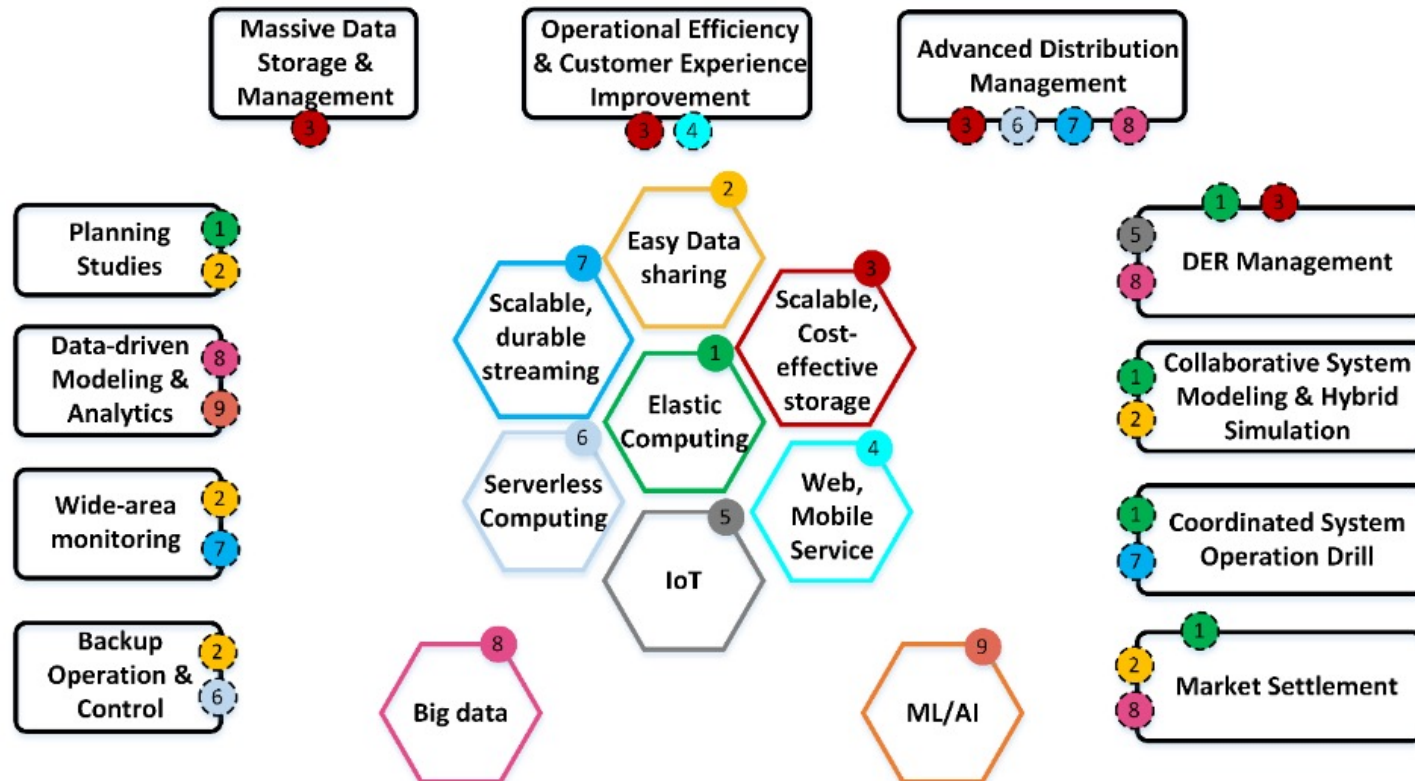
a task force under IEEE PES Big Data & Analytics (BDA) Subcommittee, Analytic Methods for Power Systems (AMPS) Technical Committee

Our **Mission** - promote cloud computing in electric energy sector, facilitate the industry with use of this mature, well-proven and state-of-the-art technology in power systems reliably and securely, with a focus on non-CIP workloads for operation, planning, monitoring and control.

<https://sites.google.com/view/cloud4powergrid/>

TF: 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



Upcoming Task Forces

- Data sharing in energy systems - Continuation of the Data Access effort
- Data Analytics for Energy Storage



- **Task Force Proposal:**
 - **Data Sharing in Energy Systems**

- Chair: Yi Wang, The University of Hong Kong
- Vice-Chair: Ricardo Bessa, INESC TEC
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- **Backgrounds**

- *Data barrier becomes a fundamental concern for big data analytics for power systems.*
- There are two main reasons for the formation of data barriers: **privacy issues** because of legal risks and **business competition**.
- Thus, to break the data barrier and promote data sharing, efforts should be devoted to two aspects: 1) **privacy-preserving data analytical methods**; 2) **data pricing or valuation approaches**. Both are emerging topics in power and energy systems.

• Preliminary Discussion

- Dr. Yi Wang and Dr. Ricardo Bessa, i.e., the two proposers of the task force, had a **preliminary discussion** with Dr. Yannan Sun (Chair of the Subcommittee), Dr. Yang Weng (Secretary of the Subcommittee), and Dr. Ning Zhou (Chair of the Big Data Access Working Group) before GM.
- The proposers revised the task force proposal a little bit to better contribute to the Subcommittee and researchers in power systems. **We believe the proposed task force is a good extension of the current Big Data Access Working Group.**
- It is good to **continue and include the work in the Big Data Access Working Group in the task force.** The work includes providing more open datasets for power system research, maintaining the website for big data access, etc.

• Aim of the Task Force

- 1) **Identify data barriers** in the process of power and energy generation, transmission, distribution, and consumption;
- 2) Investigate recent advances in **privacy-preserving machine learning methods** (e.g., federated learning, differential privacy, etc.) and their applications in power and energy systems;
- 3) Summarize and compare **data trading mechanisms and data value quantification methods** in different industries, including the power and energy industry;
- 4) Summarize **practical implementations** in data privacy and pricing;
- 5) Provide recommendations for **typical application scenarios** for data sharing in power and energy systems, including energy forecasting, behavior modeling, grid control, energy and non-energy digital services, etc.;
- 6) Include **more open datasets** based on current datasets provided in by the Big Data Access Working Group;
- 7) Optimize and maintain **the website for big data access**.

- **Activities [A] and End-Products [D]**

- [A1] Three virtual meetings per calendar year.
- [A2] One in-person meeting per year during IEEE PESGM.
- [A3] Organization of panel sessions or workshops at major IEEE conferences.
- [D1] Report on data sharing in energy systems.
- [D2] Tutorial on data sharing in energy systems.
- [D3] One or two standard test datasets for data sharing algorithms.
- [D4] Big data access website.

Supporting Members

Members are diversified: different regions, academia/industries.

Name	Institute	Country/Region
Yi Wang	The University of Hong Kong	Hong Kong
Ricardo Bessa	INESC TEC	Portugal
Jie Song	Peking University	China
Qinglai Guo	Tsinghua University	China
Liyang Han	Technical University of Denmark	Denmark
Chao Ren	Nanyang Technological University	Singapore
Edith C. H. Ngai	The University of Hong Kong	Hong Kong
Pierre Pinson	Imperial College London	UK
Qingsong Wen	Alibaba DAMO Academy	US
Zengxiang Li	Digital Research Institute ENN Group	China
Jin Ma	University of Sydney	Australia
Fei Teng	Imperial College London	UK
Abdulsalam Yassine	Lakehead University	Canada
Jean-Francois Toubeau	University of Mons	Belgium
Mingyang Sun	Zhejiang University	China
Miha Grabner	University of Ljubljana	Slovenia
Sarasij Das	Indian Institute of Science Bengaluru	India
Paul Cuffe	University College Dublin	Ireland
George Kariniotakis	MINES ParisTech	France

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

Agenda

- Welcome and Member Introduction
- Approval of 2021 Meeting Minutes
- Announcements
- Subcommittee Sponsored Activities for the Past Year
- **TCPC Reports on GM2022 Papers and Panel Sessions**
- Call for Panel Ideas for GM2023



GM2022 Papers

- 2022 Papers for PES GM
 - Total paper submitted: 42
 - Accepted: 22
- 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@domininenergy.com

Committee	Best Papers Quotas	Paper Forum Quotas
Total Analytical Methods for Power Systems	12	36
Big Data Analytics	2	7

Panels in GM 2022

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)

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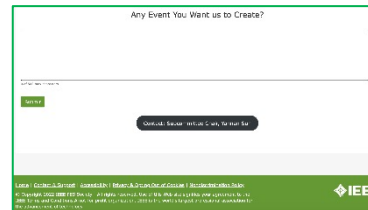
Panel Proposal Submission for 2023 GM

- Proposal template will be sent to all registered attendees after this meeting

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

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