

## DR BIKASH CHANDRA PAL

B.Eng(Hons), M.Eng, Ph.D, DIC, FIEEEE(USA), FIET(UK)

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### Overview

Bikash Pal is Professor of Power Systems at Imperial College London. He is research active in electrical power system stability, control and computation. His research is sponsored by ABB, SIEMENS GE, National Grid, and EPSRC UK. He leads a six-university UK China research consortium on Sustainable Energy Supply. Between 2013-2017, he led an eight-university UK-India research consortium on Smart Grid and Storage and a six-university UK-China research consortium in Smart Grid and Control. SIEMENS RD collaborated with him to develop fast power flow and volt-var control tools in Spectrum Power, an advanced module for distribution management system solution from SIEMENS. This is now commissioned in distribution control centres in Columbia, Bosnia Norway and Azerbaijan serving 15 million customers in these countries. GE commissioned sequel of projects with him to analyse and solve wind farm HVDC grid interaction problems (2013-2019). He has developed and validated a prize winning 68-bus power system model, which now forms a part of IEEE Benchmark Systems as a standard for researchers to validate their innovations in stability analysis and control design. Power network operators and transmission equipment manufacturers, United Nations (Clean Development Mechanism) have consulted him for solving technical problems in power transmission and renewable energy. He has offered training courses to practising engineers in power industry in power system stability, control and protections in Qatar, UAE, India, Chile, Malaysia. He has graduated 23 PhDs and published about 115 IEEE Transactions papers and co-authored four books. He is Vice President of Publications, IEEE Power and Energy Society. He is Series Editor of Elsevier series on Sustainable Energies and Fellow of IEEE. He was Editor-in-Chief of IEEE Transactions on Sustainable Energy (2012-2017) and IET Generation, Transmission and Distribution (2005-2012). He was Otto Monstead Guest Professor at Denmark Technical University (DTU) in 2019, was Mercator Professor sponsored by German Research Foundation (DFG) at University of Duisburg-Essen in 2011. He holds a Visiting Professorship at Tsinghua University, China.

### Education

- **PhD and DIC** in Electrical and Electronic Engineering at Imperial College of Science, Technology and Medicine, University of London, 1999, Thesis: *“Robust Damping Control of Inter-area Oscillations in Power Systems with Superconducting Magnetic Energy Storage Devices”*.
- **M.Eng**, Electrical Engineering, Indian Institute of Science, India, 1992.
- **B.Eng**, Electrical Engineering at Jadavpur University, India, 1990.

### Employment

- *Professor of Power Systems*, Electrical and Electronic Engineering Dept, Imperial College London, UK, 08/2013 -present.
- *Reader*, Electrical and Electronic Engineering Dept, Imperial College London, UK, 2007-2013.

- *Senior Lecturer*, Electrical and Electronic Engineering Dept, Imperial College London, UK, 2005-2007.
- *Lecturer*, Electrical and Electronic Engineering Dept, Imperial College London, 2001-2005.
- *Assistant Professor*, Electrical Engineering Dept, Indian Institute of Technology Kanpur, 1999-2001.
- *Lecturer*, Electrical Engineering Dept, Jadavpur University, India, 1993-1996.
- *Research and Design Engineer*, Tata Consulting Engineers, India, 1991-1993.

## Honours and awards

- *Otto Monstead Professor* through nomination from the President of Denmark Technical University to Otto Monstead Foundation, July-September 2019.
- *IEEE PES Prize Paper Award 2018: Emilio Barocio, Bikash C. Pal, Nina F. Thornhill and Arturo Roman Messina : "A Dynamic Mode Decomposition Framework for Global Power System Oscillation Analysis", IEEE Transactions on Power Systems, Vol. 30, No. 6, pp. 2902-2912, Nov 2015*
- *IEEE PES Technical Committee Working Group Recognition Award for Benchmark Systems for Stability Controls Task Force, July 2016.*
- President's outstanding research team award at Imperial College London 2016. This award celebrates the achievement of outstanding research teams at Imperial, recognising, a team 's international standing and their beneficial contribution to Imperial.
- *Fellow of the IEEE for contribution to power system stability and control, 2013.*
- *Editor-in-Chief, IEEE Transactions on Sustainable Energy, 2012-2017.*
- *Series Editor of Elsevier monograph series on Sustainable Power and Energy Systems, 2014-present.*
- *Editor-in-Chief, IET Generation, Transmission and Distribution, 2005-2012.*
- *Mercator Guest Professor* through nomination from the President of University of Duisburg-Essen to German Research Foundation, January-September 2011.
- *IET Renewable Power Generation Journal Annual Premium Paper Award, 2008.*
- *IEEE Power and Energy Society Distinguished Lecturer (DL) on Power System Control and Computation, 2008-2011.*
- *IEEE PES Working Group Recognition Award 2008 for the IEEE Special Publication 07TP190 Black-out Experiences and Lessons, Best Practices for System Dynamic Performance, and the Role of New Technologies.*
- *Visiting Professor*, Tsinghua University, China, 2012-present
- *Fellow of the IET*, UK, 2006.
- *Royal Society visiting fellowship*, 2004.
- *Young Teacher Award*, All India Council for Technical Education (AICTE), 2000.
- *Eryl Cadwallader Davies prize for the best PhD thesis* in 1999 from Imperial College London.
- *Commonwealth PhD Research Award*, UK, 1996.

## Research

### Key research contributions

1. He pioneered *linear matrix inequality optimisation framework for robust control of power system inter-area oscillations*. Unlike generalised  $H_\infty$  robust control, this framework solved the damping control optimisation problem realistically satisfying the control requirement in power system. The outcome of this research has attracted ABB Corporate Research to set up strategic research collaboration with his research group in power transmission control since 2001 through series of fully funded research projects. A host of algorithms was transferred to ABB power business unit through a training workshop.
2. SIEMENS RD collaborated with him to develop fast power flow and volt-var control tools in Spectrum Power, an advanced module for distribution management system solution from SIEMENS. This is now commissioned in distribution control centres in Columbia, Bosnia Norway and Azerbaijan serving 15 million customers in these countries.
3. He and his students first proposed a *unified Smith predictor based control solution to eliminate the impact of remote feedback signal transmission delay in power system oscillations damping*.
4. He and his student developed a *generalised dynamic modelling framework for synchronous and asynchronous power generation in interconnected electric energy network for small signal stability analysis*. One research paper published in 2008 received the best technical journal paper of the year award from the IET Renewable Power Generation. This research in wind energy dynamic modelling have benefited industry (Alstom Grid, now GE Grid solutions UK) in their North Sea wind farm interconnection technical study and activities through several advanced technical consulting grants through college.
5. He and his research associate developed a *nonlinear signal processing algorithm to characterise the mechanism of power blackouts*. Besides power engineering research community, researchers from structural engineering, biomedical signal processing, speech and acoustics disciplines have cited this research.
6. He and his student introduced a *statistical method of sensor placement in power distribution network for state estimation*. This technique established the fact that only 15 to 20% of total power distribution network measurements are adequate to estimate the states of the entire system with 95% accuracy. The implication is in huge cost reduction in investment in sensor placement and associated data communication infrastructure. The follow on activity has not only cemented longer term collaborative partnership with UK power companies such as UKPN, Scottish and Southern (SSE), it also resulted in DNO Guide to Future Smart Management of Distribution Networks. Some of the earlier findings on power losses estimation is being applied to accurately estimate the loss in part of SSE distribution network model in Hampshire County.
7. He has developed a benchmark model for power system stability and control design upon invitation from the Chair of the IEEE Power and Energy Society (PES) sponsored Task Force on benchmark power system model.

### Research grants

Over the past 15 years, the total value of the grants raised as PI is about £9M with his share of £5M. As Co-I, his share is £2.3 M.

35. PI: *Cyber Resilient Micro Grid: European Commission* : H2020-MSCA-IF-2020 EESC-P89866-101026657, 225k, 2021-2023
34. Co-I: *Renewable Energy EMPOWERing European and InDIan communities (RE-EMPOWERED)*, H2020-LC-SC3-2020-NZE-RES-CC-IA: EESC-P89162- 101018420, 562k, 2021-2024.

33. Co-I: *InnoCyPES* European Commission: H2020-MSCA-ITN-2020 EESC-P85490- 956433, 606k, 2021-2024.
32. PI: *MIDER: Monolithic integration of Renewable Energy Resources* : European Commission: H2020-MSCA-IF-2020 Marie Curie programme: 212k 2020-2022.
31. PI: *Resilient Operation of Sustainable Energy Systems (ROSES)* EPSRC-NSFC Programme on Sustainable Energy Supply £775k. Prof. Pal leads the UK side of this six-university (Imperial, Southampton and Warwick, Hohai, NCEPU and Tsinghua) consortium project.
30. Co-I: *WinGrid* European Commission: H2020-MSCA-ITN-2019 EESC-P79159-861398 606k 2019-2023
29. PI: *Estimation in PV dominated power network for stability and control* ,EESC P78479, EPSRC, UK, £100k, 2019-2020.
28. PI: *A Novel Hybrid Microgrid Control Framework Including Multi-Mode Large-scale EVs Integration* TGOOD, Hong Kong £500k, 2018-2022.
27. PI: *PV Control and Integration (PVCI)*: European Commission: H2020-MSCA-IF-2016 Marie Curie programme: 183k 2017-2019.
26. Co-I: *Joint UK-India Clean Energy Centre (JUICE)*: EP/P003605/1: £1M, 2016-2020. Prof Pal leads Imperial on this multi-university programme.
25. PI: *State Estimation for Active Distribution Network*, Scottish and Southern Energy (SSE) UK, £25k, 2015-2016.
24. PI: *Stability and Control of Power Networks with Energy Storage (STABLE-NET)* UK-China Grid Scale Storage, EPSRC, UK,(EP/L014343/1) £1.0M, 2014-2016. Prof. Pal led this three-university (Imperial, Oxford and Strathclyde) consortium project.
23. PI: *Investigation of Sub-synchronous Interaction between Wind Turbine Generators and Series Capacitors*, National Grid, UK, £60k,2014-2015.
22. PI: *Model Simplification of Wind Farm for Grid Interaction Study*, ALSTOM UK, £100k, 2015-2017.
21. PI: *Reliable and Efficient System for Community Energy Solution- RESCUES*, UK-India Smart Grid programme, EPSRC, UK, EP/K03619X/1: £980k, 2014-2016. Prof. Pal led this three-university (Exeter, Imperial and Strathclyde) consortium project.
20. Co-I: *Advanced Communication and Control for the Prevention of Blackouts (ACCEPT)*, UK-India Smart Grid programme, EPSRC, UK,EP/K036173/1: £310k, 2014-2016.
19. Co-I: *PV2025 - Potential Costs and Benefits of Photovoltaics for UK-Infrastructure and Society*, EP-SRC, UK, EP/K02227X/1: £308k, 2013-2016.
18. PI: *Offshore HVDC grid development in the North Sea: a pre-study*, STATNET, Norway, £20k, 2012.
17. PI: *State Estimation for Active Distribution Network*, Scottish and Southern Energy (SSE) and EP-SRC, UK, £102k, 2011-2015.
16. PI: *Modeling and control of AC-DC System with Significant Generation from Wind*, National Grid, UK, £45k, 2010-2014.
15. PI: *Stability and Performance of Photovoltaics* EPSRC, UK,£571k, 2010-2013.

14. Co-I: *Using Real-time Measurements for Monitoring and Management of Power Transmission Dynamics for the Smart Grid*, European Commission, £353k, 2010-2014, as Co-I his share: £175k.
13. Co-I: *Power System Wide-area GPS Synchronized Monitoring with Phasor Measurements and Low-Frequency Oscillation Mitigation Analysis* European Commission 137k: 2010-2011: as Co-I his share: £68.5k.
12. Co-I: *Control for Energy and Sustainability*, EPSRC, UK, £5.8M : 2009-2014, as Co-I his share: £100k.
11. PI: *Smart and Flexible Control*, The Beit Trust, £33k, 2008-2011.
10. PI: *A Wide-Area System for Power Transmission Security Enhancement using a Process Systems Approach* EPSRC, UK, £272k, 2007-2010.
9. PI: *Risk Assessment of Distribution Systems for Operational Purposes*, £450k, as PI his share: £270k.
8. PI: *SUPERGEN FLEXNET* EPSRC, UK, £6.38M, 2007-2011: as Co-I his share: £330k.
7. PI: *Feasibility of Risk Assessment in EDF Network*, EDF Energy, UK, £48k, 2006-2006.
6. PI: *State Estimation in Distribution Network: Methodology and Implementation* EDF Energy UK, £400k, 2006-2009, as PI his share: £240k.
5. PI: *Measurement based FACTS control in power systems*, ABB Switzerland, \$300k, 2004-2006.
4. Co-I: *Future Network Technologies for Sustainable Energy Generation (Supergen)*, EPSRC UK, £520K, 2004-2006, as Co-I his share £200k.
3. PI: *Robust Damping of Oscillations in Large Power Grid Through FACTS Controllers Employing Global Signals*, EPSRC, UK, £123k, 2002-2005.
2. Co-I: *Single and Multiple UPFCs as Aids to the Improvement of Supergrid Dynamic and Transient Performance*, ABB USA, £104k, 2002-2005 : As PhD supervisor and grant service provider of the grant held by Green and Jaimoukha.
1. Co-I: *Single and Multiple UPFCs as Aids to the Improvement of Supergrid Dynamic and Transient Performance* EPSRC, UK, £238k, 2002-2004 : As PhD supervisor and grant service provider of the grant held by Green and Jaimoukha.

## Research supervision

### PhD students supervision in progress

11. Ali Arjomandi (PhD 1st Year)
10. Mert Kesici (PhD 1st Year)
9. Sai Pavan Polisetty (PhD 1st Year)
8. Andreas Nikolou (PhD 1st Year)
7. Yanshu Niu (PhD 1st Year)
6. Jintao Wang (PhD 1st Year)
5. Malek AM Alduhaymi (PhD 1st Year)
4. Sowmya Nagam (PhD 2nd Year)

3. Adeyemi Alabi (PhD 2nd Year)
2. LIU Zhaoru, (PhD 2nd Year)
1. Vu Yue (PhD 3rd Year)

### PhD students graduated

(Total: 23; 19 sole supervision and 3 joint supervision)

23. Nicolás Cifuentes *A New Approach to the Fault Location Problem: Using the Fault's Transient Intermediate Frequency Response*; 2017-2021, International Power System Consultants, London.
22. Jerome Nsengiyaremye *Protection of Multi-Inverter Based Microgrid Using Phase Angle Trajectory*; 2017-2020, MIT, Boston, USA
21. Firdous Ul-Nazir, *Stochastic Volt/VAr Control of Power Distribution Systems*; 2016-2019, Imperial College London.
20. Husni Ali Rois, *Model Order Reduction of Wind Farm*; 2015-2019, Universitas Gadjah Mada, Indonesia
19. Onyema Nduka, *Impact Assessment of Harmonics Emissions on Active Distribution Network Planning and Operation*; 2015-2018; Imperial College London.
18. Luching Zhang, *Optimal Scheduling in Sensor Networks*; 2013-2017, joint supervision with Dr Eric Kerrigan, CITI bank.
17. Georgios Anagnostou, *Dynamic State Estimation Under Stressed Conditions in Modern Power Networks*; 2012-2016, joint supervision with Prof Nigel Brandon of Earth Science Engineering, Imperial College London.
16. Ankur Majumdar, *Security in Power System State Estimation*; 2012-2016, Imperial College London.
15. Sara Nanchian, *State estimation for active distribution network*; 2011-2015, Imperial College London.
14. Abhinav Singh, *Decentralised Estimation and Control for Power Systems*; 2011-2014, Imperial College London.
13. Mohd Bin Ariff, *Adaptive Protection and Control for Wide-Area Blackout Prevention*; 2010-2014, Universiti Tun Hussein Onn Malaysia.
12. Stefanie Kuenzel, *Modelling and control of an AC-DC system with significant generation from wind*; 2010-2014, Royal Holloway, University of London.
11. Yashodhan Agalgaonkar, *Control and Operation of Power Distribution System for Optimal Accommodation of PV Generation*; 2010-2014, Imperial College London.
10. Linash Puthenpurayil Kunjumammed, *Analysis and Control of Power System with Wind Generation*; 2008-12, Imperial College London.
9. Dumisani Simfukwe, *Enhancement of Power System Loading Capacity Through Low Order Robust Control Design*; 2008-12, ALSTOM R&D.
8. Efthymios Manitsas, *State Estimation and Active Management in Power Distribution Networks*; joint supervision with Prof Strbac, 2006-11, Worley Parson, UK.
7. Jerry Thambirajah, *A wide area system for power transmission security enhancement using a process systems approach*; joint supervision with Prof Thornhill of Chem Engg., Credit Swiss, UK, 2008-11.

6. Ravindra Singh, *State estimation in power distribution network operation*; 2006-09, ABB Corporate Research, USA.
5. Françoise Mei, *Small-signal modeling and analysis of doubly-fed induction generators in wind power applications*; 2004-08, MSCI, London.
4. Fu Le, *Voltage stability monitoring and enhancement in electrical power systems using transformer tap changers*; 2004-07, National Grid, UK.
3. Krishna Kumar Anaparthi, *Measurement based identification and control of electromechanical oscillations in power systems*; 2003-06, GE Global Research Centre, Germany.
2. Rajat Majumder, *Design and laboratory implementation of robust FACTS controller for interconnected power systems*; 2003-05, University of Queensland, Australia.
1. Balarko Chaudhuri, *Robust control of inter-area oscillations in power systems using FACTS controllers*; 2002-05, Imperial College London.

### Post-Doc supervision

- 1 Dr Yifei Guo, Resilient Operation in Sustainable Energy Systems ( 2020-present)
- 2 Dr Georgios Kampitsis , Modelling and control of wide bandgap power devices for power network stability improvement ( 2020-present)
3. Dr Firdous Ul-Nazir, Robust voltage and var control in power distribution networks ( 2020-present)
4. Dr Onyema S Nduka, Harmonics modelling and analysis in power distribution networks ( 2019-2020)
5. Dr Efstratios Batzelis, PV integration and control (2017-2019 MC Fellow , 2020-2025, RAEngg Fellow)
6. Dr Georgios Anagnostou, power system stability (2016-2019)
7. Dr Ankur Majumder, power system state estimation (2016-2017)
8. Dr Sara Nanchian, power system state estimation (2016-2017)
9. Dr Abhinav K Singh, power system dynamics, stability and control (2014-2017)
10. Dr Stefanie Kuenzel, Windfarm layout optimisation and control (2013-2016)
11. Dr Linash Puthenpurayil Kunjumuhammed, wind energy control (2012- 2019).
12. 10 other post docs for a combined total of 15 RA years between 2001-2014.

### Academic Visitors

1. Dr Mats Larsson (3 months), Senior Principal Scientist, ABB Corporate Research, Switzerland, 2014
2. Dr Yan Zhang (3 months), Principal Scientist, ABB Corporate Research, Switzerland, 2014.
3. Dr Tatiana Mariano Lessa de Asiss (12 months), UFRJ, Rio de Janeiro, Brazil, 2015.
4. Prof. Antonio Padhila Feltrin (12 months), UNESP, Brazil, renewable energy, 2012
5. Prof. Odilon Tortelli (12 months), University of Parana, Brazil, control, 2012.
6. Prof. Elizete Lourencio (12 months), University of Parana, Brazil, state estimation, 2012.
7. Six other academic visitors spent their sabbaticals in his group between 2001-2011.

8. Mr Gustavo Dill (6 months), Federal University of Santa Catarina, Brazil, robust control, 2012
9. Mr. Antti Harzula (3 months), FINGRID, Finland, dynamic monitoring, 2012.
10. Dr Eduardo Caro (4 months), Universidad de Castilla, Spain, state estimation, 2010.
11. Prof. Emilio Barocio (3 months), University of Guadalajara, Mexico, dynamic monitoring, 2009.
12. Prof. Arturo R. Messina (1 month), CINVESTAV, Mexico, dynamic monitoring, 2007.
13. Prof. Chandan Chakraborty (1 month), IIT Kharagpur, renewable energy, 2004.

## Collaborators

1. Prof Nina Thornhill, Imperial College: dynamic monitoring, 2005-2020.
2. Dr Nelson Martins, CEPTEL, Brazil: power system control, 2009-2012.
4. Prof Chandan Chakraborty, IIT Kharagpur: photovoltaics, 2011-present.
5. Prof Erlich Istvan, University of Duisburg-Essen: AC-DC grid, 2011-2012.
6. Prof Miroslav Begovic, Georgia Tech, Texas A & M USA: voltage stability and protection, 2008-2009, 2018-2020.
7. Prof Arturo R. Messina, CINVESTAV, Mexico, dynamic monitoring 2007-2010.
8. Prof Rabih Jabr, American University of Beirut: power system computation and control, 2003-present

## Teaching

He has developed and taught the following lecture courses:

1. Power Electronics and FACTS (M.Eng/MSc, 4th year) (50%; 2007-present)
2. Power System Control, Measurements and Protections (M.Eng/MSc, 4th year) (100%; 2007-present)
3. Electric Energy Systems (B.Eng, 3rd year) (50%; 2002-2006)
6. Environmental and Economic Issues in Power Systems (M.Eng, 4th year) (50%; 2002-2006)
5. Modeling and Control in Power Engineering (M.Eng/MSc, 4th year)(50%; 2002-2006)
4. Power System Dynamics and Stability (at IIT Kanpur)(M.Tech) (100%, 2000-2001)
5. Advanced Power System Stability (at IIT Kanpur)(M.Tech)(100%, 2000-2001)
6. Electrical Technology (at Jadavpur University)(B. Eng)(100%; 1993-1996)
7. Principle of Electrical Engineering (at Jadavpur University)(B.Eng) (100%; 1993-1996)

## Departmental administration

### Examinations, programme management

- *Director, MSc programme in Future Power Networks:* As founding director he developed the entire curriculum and now leads the programme (2014-2018).
- *Examination officer:* He led the department exam paper production process, 2004-2012.



## Student scholarship, international education exchange

1. At Imperial he led an initiative to obtain scholarship for UG students from industry sponsored UK Power Academy. 46 scholarships were secured between 2007-2011. More than 50% scholars remained in UK power sector after graduation.
2. He led an initiative in setting up longer term collaboration with power companies and academic in Brazil leveraging Science Without Border programme of Brazilian Govt. So far 5 Brazilian researchers in power area have joined the group.

## External professional activities

### External examinations

- *MSc course*, Brunel University, 2012-2016.
- *BEng course*, University of West Indies, 2009-2010.
- *PhD examiners*, University of Warwick, Birmingham, Manchester, London, West Indies, Liege, NTNU, QUT, NTU, Aalborg, DTU, and IITs.

### Member of peer review panels

- Chair, International Panel, Science Foundation Ireland (SFI), Partnership Programme, 2021.
- Member, International Advisory Committee, North China Electric Power University, 2019-
- Member, International Panel, Science Foundation Ireland (SFI), Partnership Programme, 2015.
- Programme Evaluator: Europe-China Clean Energy Centre (EC2), joint programme of Politecnico di Torino, Italy and Tsinghua University, China, 2012.
- National Council for Scientific Research, Lebanon, 2011.
- Texas A & M University, Distinguished Professorship Evaluation Panel, 2011.
- EPSRC, UK, 2006-present.
- Archimedes-III of the Govt of Greece, 2011.
- Thalys of the Govt of Greece, 2011.
- National Priority Research Programme, Qatar National Research Foundation, 2009.
- Research Proposal, King Fahd University of Petroleum and Minerals, 2009.

### Editorial activities

- Senior Editorial Advisor (SEA) *Journal of Modern Power Systems and Clean Energy*, State Grid Corporation Electric Power Research Institute, China.
- Editor-in-Chief, *IEEE Transactions on Sustainable Energy*, 2012-2017. The journal received its first impact factor of 3.84 in June 2014 and the 2018 impact factor is 7.65.
- *Series Editor of Elsevier monograph series on Sustainable Power and Energy Systems*, 2014-2018.

- Editor-in-Chief, *IET Generation, Transmission and Distribution*, 2005-2012. Journal impact factor improved from 0.29 (2005) to 1.19 (2011)
- Associate Editor, *IEEE Transactions on Control Systems Technology*, 2014-present.
- Editor, *IEEE Transactions on Sustainable Energy*, 2009-2012.
- Associate Editor, *International Journal of Systems Science*, 2003-2009.
- Editorial Board, *International Journal of Electric Power Components and Systems*, 2003-2009.

### **Roles in IEEE Task Forces, Working Groups and Committees**

- Member, IEEE PES Governing Board (2019-)
- Member, IEEE PES Executive Committee ( 2019-)
- Member, IEEE PES Finance Committee ( 2019-)
- Vice President, Publications, IEEE Power and Energy Society ( 2019-)
- Vice Chair, IEEE Power System Dynamic Performance Committee of the Power and Energy Society
- Chair: IEEE PES Working Group on Distribution System State Estimations: Practical Challenges, Limitations of Current Tools and Research Need, 2013-present.
- Member: IEEE Periodical Committee (PerCom) (2018-2019): Responsible for assessing new periodical proposals and working with committee Chair for making recommendation to TAB.
- Chair: Non-PES Conference Liaison (NPCL) Committee of the IEEE Special Publications and Outreach Programme, 2008-2012.
- Member representing the UK, International Task Force on Blackouts Investigation, Analysis and Mitigation, IEEE PES, 2006-2008.
- Member representing the UK, Task Force on Advanced Power System Security, C4 of CIGRE, 2004-2007.

### **Conference panel chairs**

- Chair: Keynote Speech Session, 6th IEEE PES Asia-Pacific Power and Energy Engineering Conference, Hong Kong, 7-10 December, 2014.
- Panel Chair: Stability and Control in Smart Power Grid, 8th IFAC Symposium on Power Plant and Power Systems Control (PPPSC), Toulouse, France, September 2-5, 2012
- Panel Chair: Challenges in Distribution System State Estimation , IEEE PES General Meeting, San Diego, CA, USA, 22-26 July, 2012.

### **Industrially funded consulting**

Besides winning the best annual journal paper award in 2009, the research in wind energy dynamic modelling have benefited industry (Alstom Grid, now GE Grid solutions UK) in their North Sea wind farm interconnection technical study. Tools were developed for the dynamic analysis and interaction study for National Grid.

- *Stability criteria and specifications of power electronics interfaces for power network operation*, National Grid Electricity Transmission (NGET) (2020-2021)
- *Technical methodology and tool development to support Clean Development Mechanism (CDM), United Nations Framework on Climate Change*. Appointed as technical consultant to review and recommend revised methodology and tool for transmission constraint and losses calculation, United Nations, Bonn, Germany Aug-Oct 2017.
- *Small scale energy storage (SSES)*, UK Power Networks, 2016-2017
- *Windfarm dynamic equivalencing*, GE Grid Solutions UK Ltd, 2016-2019.
- *Technical investigation of sub-synchronous interaction between wind turbine generators and series capacitors*, National Grid, UK, 2014-2015.
- *Aggregated wind farm dynamic interconnection model and analysis involving Type-IV turbines*, ALSTOM UK, 2015-2016.
- *Aggregated wind farm dynamic interconnection model and analysis involving Type-III turbines*, ALSTOM UK, 2014-2015.
- *Investigation of synchronisation problem of offshore wind farm with the grid*, ALSTOM, UK, 2013-2014.
- *North Sea power grid vision for Norwegian power grid operator, STATNET, Norway*, 2012.

## Invited lectures

### Keynotes and plenary talks

- *Robust Volt-Var Control in Power Distribution Systems*, keynote talk, Second International Conference on Smart Energy Technologies, Sept 8-10, 2021, Finland.
- *Volt-Var Control in Power Distribution Systems*, keynote talk, 12th IEEE PES Asia-Pacific Power and Energy Engineering Conference, Nanjing, China, Sept 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, keynote talk, International Conference on Power, Energy and Electrical Engineering, Dec 19-21, 2018, London, UK.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, keynote talk, Second International Conference on Smart Energy Technologies, Sept 9-11, 2019, Porto, Portugal.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, keynote talk, 20th National Power System Conference, Dec 14-16, 2018, NIT Trichy, India.
- *Role of Control and Measurement in Future Power Networks*, plenary talk, IEEE International Conference on Control, Measurement and Instrumentation, Jan 2016, Kolkata, India.
- *Role of Robust Control in Smart Grid*, keynote, 12th SEPOPE Conf. CIGRE, May 2012, Rio de Janeiro, Brazil.
- *Control and computation in Smart Grid*, keynote, IEEE Conf. on Power, Control, Signal Processing and Computations (EPSCICON), Jan 2012, Kerala, India.
- *Role of Robust Control in Smart Grid*, keynote, IEEE Conf. on Power Electronics, Drives and Energy Systems, Dec 2010, New Delhi, India.

- *Computational Advances in Robust Power Transmission Control*, plenary, Intl Conf. on Advances in Computational Tools For Engineering Applications, July, 2009, Beirut, Lebanon.
- *Power System Stability: New Challenges and New Solutions*, keynote, IEEE PES Symposium, Nov 2006, Zurich, Switzerland.
- *Small Signal Modelling and Analysis of Variable Speed Wind Energy Conversion Systems*, keynote, IEEE PES Symposium on Modeling and Analysis of Large Electrical Machines, Aug 2005, Calcutta, India.

### IEEE Distinguished Lectures

- *Robust Volt Var Control in Power Distribution Systems*, IEEE IAS/PES Chapter, Bombay, India 2022.
- *Robust Volt Var Control in Power Distribution Systems*, IEEE PES Chapter, Shanghai, China, 2022.
- *Robust Volt Var Control in Power Distribution Systems*, IEEE PES Chapter, Utah, USA, 2021.
- *Robust Volt Var Control in Power Distribution Systems*, IEEE PES Chapter, Malaysia, 2021.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE PES Chapter, Victoria, Australia, 2021.
- *Robust Volt Var Control in Power Distribution Systems*, IEEE PES Chapter, South Australia, Australia, 2021.
- *Robust Volt Var Control in Power Distribution Systems*, IEEE PES Chapter, Idaho, USA, 2021.
- *Robust Volt Var Control in Power Distribution Systems*, IEEE PES Chapter, Saudi Arabia, 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE PES Chapter Italy, 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE PES Chapter Macedonia, 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE PES Chapter Portugal, 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE PES Chapter Netherlands, 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE PES Chapter Turkey, 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE PES Chapter Romania, 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE Subsection Bhubaneswar, India, 2020.
- *Dynamic Modeling for Analysis of Wind Farm and Grid Interaction*, IEEE PES Chapter, Delhi, India, 2020.
- *Dynamic State Estimation and Control of Power Systems*, IEEE PES Chapter, Gujarat, India, 2020.
- *Dynamic State Estimation and Control of Power Systems*, IEEE PES Chapter, Kolkata, India 2020.
- *Dynamic State Estimation and Control of Power Systems*, IEEE PES Chapter, Singapore, 2020.

- *Dynamic State Estimation and Control of Power Systems*, IEEE PES Chapter, Denmark, 2020.
- *Dynamic State Estimation and Control of Power Systems*, IEEE PES Chapter, UKRI, UK, 2020.
- *Advances in Computations and Control in Power Systems*, IIT Madras, India, 2009.
- *Measurement Placement for Distribution System State Estimation* in Jadavpur University, Kolkata, 2009.
- *Computational Advances in Robust Power Transmission Control*, IIT Kharagpur, India, 2009.
- *Robust Power Transmission Control*, Power Grid Corporation of Bangladesh, Dhaka, 2009.
- *Advances in Computation and Control in Power Systems*, BUET, Dhaka, 2009.
- *Linear Matrix Inequality (LMI) approach to damping control design employing FACTS devices* POLITECNICO DI TORINO, Italy, 2009.
- *Linear Matrix Inequality (LMI) approach to damping control design employing FACTS devices*, CEPTEL, Brazil, 2008.
- *Robust Control of Power Systems*, University of Guadalajara, Mexico, 2008.

### **Invited industry courses/tutorials**

- *Power System Stability and Control*, Blazeavenue, Dubai, December, 2018.
- *Power System Protections*, Tenaga Nasional Berhad (TNB), Malaysia, November, 2017.
- *Wind farm interaction with VSC*, GE Grid Solutions, stafford, UK, October, 2016.
- *Power System Dynamics, Stability and Control*, System Operators: CDEC-SIC and CDEC-SING, Santiago, Chile, September, 2016.
- *Sub-synchronous interactions between wind turbine generators and series compensation: A case study for GB model*, Warwick, UK, April, 2016.
- *Stability modeling and analysis of renewable energy sources*, 10 days long course under Global Initiative of Academic Networks, National Institute of Technology, Agartala, India. January 2016.
- *Stability and Control Problem in Interconnected AC Systems*, Abu Dhabi Water and Electric Authority (ADWEA), April, 2015.
- *Power System Protections*, Continuing Education Programme, Texas A & M , Qatar, 2014.
- *Power System Measurement, Control and Protection*, Continuing Education Programme, Texas A & M , Qatar, 2013.
- *Power System Stability*, Tata Consulting Engineers, Bangalore, 2011.
- *Overview of Power System Stability*, Worley Parsons Limited, London, 2011.
- *Subsynchronous Resonance in Power Systems*, Worley Parsons Limited, London, 2009.
- *Power Generation Control*, CESC Ltd, Kolkata, 2007.

## Other invited lectures

- *Control and Computation for Future Power Networks*, Pontificia Universidad Catholica de Chile, Chile, September 2016.
- *Control and Computation for Future Power Networks*, Indian Institute of Technology, Delhi, May 2015.
- *Control and Computation for Future Power Networks*, MASDAR Institute, Abu Dhabi, UAE, April 2015.
- *Control and Computation for Future Power Networks*, University of Oxford, UK, June 2014.
- *Robust Control and Computation of 21st Century Electricity Grid*, Hong Kong Polytechnic University, Hong Kong, August 2013.
- *Role of Control and Computation in Smart Grid*, ETH, Zurich, 2012.
- *The Emerging Distribution Network: Operation and Control Issues*, Tsinghua University, China, 2012.
- *Robust Control and Computations in Power Systems*, Virginia Tech, USA, 2012.
- *State Estimation of Power Distribution Network*, GE Global Research Centre, Munich, Germany, 2012.
- *Low order robust control in electric power system: current trends and future challenges*, 2012 UKACC international control conference, 3-5 September, Cardiff, 2012.
- *Role of Robust Control and State Estimation in Future Electricity Networks*, University of Toronto, Canada, 2012.
- *Control and computation in power systems*, University of North Carolina Charlotte, USA, 2011.
- *State estimation for smart power distribution system*, EDF France, 2011.
- *State estimation for smart power distribution system*, Centenary lecture, Electrical Engineering, IISc Bangalore, 2011.
- *Role of Robust Control and State Estimation in Future Electricity Networks*, University of Liege, Belgium, 2011.
- Between 2001-2010, he has delivered eight other invited lectures at various universities abroad.

## Media appearances

- *The Sunday Times UK*, on wind energy, 29th March, 2008.
- *BBC News 24* on wireless power transfer, 18th October, 2007.
- *The Independent, UK*, on electrical engineering education, 26th April, 2006.
- *New Scientist*, 2003, on power blackouts in USA (14th August 2003) and in Italy (28th Sept 2003).

## Research publications

According to Google scholar, total citations: 14000, h-index: 56

## Books

- Linash Kunjumammed, Stefanie Kuenzel and Bikash Pal ,*Simulation of Power System with Renewables*, Elsevier, ISBN9780128111871, 2019.
- Abhinav Kumar Singh and Bikash C. Pal, *Dynamic Estimation and Control of Power Systems*, Elsevier, ISBN 9780128140062, 2018.
- Xiao-Ping Zhang, Christian Rehtanz and Bikash Pal *Flexible AC Transmission Systems: Modeling and Control*, Springer, Berlin, ISBN: 3-540-30606-4, 2012.
- Bikash Pal and Balarko Chaudhuri *Robust Control in Power Systems*, Springer, New York, ISBN: 0-387-25949-X, 2005.

## IEEE and CIGRE technical Task Force reports

- E. Barocio, B. C. Pal, A.R Messina, “Modal Identification of Transient and Ambient Data Oscillations using Local Empirical Mode Decomposition and Teager-Kaiser Energy Operator”, *IEEE Modal Identification Task Force* 2011.
- C. W Taylor (Chair):*Blackouts Investigation, Analysis and Mitigation Tools*. The report of this Task Force has received **outstanding technical publication award** in 2009 in which Dr Pal was the member.
- F. Mei and B. C. Pal, “Steady state and small signal dynamic behaviours of doubly fed asynchronous generators”, *CIGRE Special Task Force Publication on Modeling and Dynamic Behavior of Wind Generation as it Relates to Power System Control and Dynamic Performance*, C4.601, no 328, pp A1-A18, August 2007.

## Journals

**Total journal publications - 139: IEEE Transactions - 114, IET/IEE journals - 21, other journals - 4, under review -2**

139. Y. Guo, B. C. Pal and R. A. Jabr, “On the Optimality of Voltage Unbalance Attenuation by Inverters“, *IEEE Transactions on Sustainable Energy*, Available through early access.
138. Y. Cheng, L. Fan, J. Rose, F. Huang, J. Schmall, X. Wang, X. Xie, J. Shair, J. Ramamurthy, N. Modi, C. Li, C. Wang, S. Shah, B. C. Pal, Z. Miao, A. Isaacs, J. Mahseredjian, and Z. Zhou, “ Real-World Subsynchronous Oscillation Events in Power Grids with High Penetrations of Inverter-Based Resources“, *IEEE Transactions on Power Systems*, Available through early access.
137. F. Ul-Nazir, B. C. Pal and R. A. Jabr, “Affinely Adjustable Robust Volt/VAr Control without Centralized Computations”, *IEEE Transactions on Power Systems*, Available through early access.
136. M. G. Dozein, B. C. Pal and P. Mancarella, ”Dynamics of Inverter-Based Resources in Weak Distribution Grids,” *IEEE Transactions on Power Systems*, Available through early access.
135. Y Guo, B. C. Pal, R. A. Jabr, and H. Gua, “Global Optimality of Inverter Dynamic Voltage Support”, *IEEE Transactions on Power Systems*, Available through early access.
134. Nicolàs Cifuentes, M. Sun, R. Gupta and B. C. Pal, “Black-Box Impedance-Based Stability Assessment of Dynamic Interactions Between Converters and Grid,” *IEEE Transactions on Power Systems*, Available through early access.
133. Nicolàs. Cifuentes and B. C. Pal, “A New Approach to the Fault Location Problem: Using the Fault’s Transient Intermediate Frequency Response”,*IEEE Open Access Journal of Power and Energy*, vol. 8, pp. 510-521, 2021.
132. S. H. Kazmi, N. Viafora, T. S. Sorensen, T. Olesen, B.C. Pal, J. Holboll, “Ofshore Windfarm Design Optimization using Dynamic Rating for Transmission Components”, *IEEE Transactions on Power Systems*, Available through early access.
131. Y Liu, AK Singh, J Zhao , AP Meliopoulos , BC Pal, MAM Ariff, T Vancutsem , G Mevudin , Z Huang, I Kamwa, L Mili, MA Salim , AF Taha, V Terzija and Y Shenglong, “Dynamic State Estimation for Power System Control and Protection”, *IEEE Transactions on Power Systems*. Available through early access.

130. J. Liu, R. Singh and B.C. Pal “Distribution System State Estimation with High Penetration of Demand Response Enabled Loads,” *IEEE Transactions on Power Systems*, vol. 36, no. 4, pp. 3093-3104, July 2021.
129. N. Hatziaargyriou, J. V. Milanovic, C. Rahmann, V. Ajjarapu, C. Canizares, I. Erlich, D. Hill, I. Hiskens, I. Kamwa, B. Pal, P. Pourbeik, J. J. Sanchez- Gasca, A. Stankovic, T. Van Cutsem, V. Vittal, C. Vournas, “Definition and Classification of Power System Stability – Revisited & Extended,” *IEEE Transactions on Power Systems*, vol. 36, no. 4, pp. 3271-3281, July 2021
128. B Pawar, E. I. Batzelis, S Chakrabarti, B. C. Pal , “Grid-Forming Control for Solar PV Systems with Power Reserves” , *IEEE Transactions on Sustainable Energy*, available through early access.
127. J. Zhao et al., “Roles of Dynamic State Estimation in Power System Modeling, Monitoring and Operation,” *IEEE Transactions on Power Systems*.vol. 36, no. 3, pp. 2462-2472, May 2021.
126. J. Nsengiyaremye, B. C. Pal, M. Begovic, “Low-Cost Back-up Line Protection for Multi-Inverter Based Microgrids,” *IEEE Transactions on Power Delivery*, available through early access .
125. Y. Yu, O.S. Nduka, and B.C. Pal, “Smart Control of an Electric Vehicle for Ancillary Service in DC Microgrid”, *IEEE Access*, vol. 8, pp. 197222-197235, 2020.
124. F. Ul-Nazir, B. C. Pal and R. A. Jabr, “Approximate Load Models for Conic OPF Solvers”, *IEEE Transactions on Power Systems*, vol. 36, no. 1, pp. 549-552, Jan 2021.
123. H Karbouj, Z H Rather, and B. C. Pal, “Adaptive Voltage Control for Large Scale Solar PV Power Plant Considering Real Life Factors”, *IEEE Transactions on Sustainable Energy*, vol. 12, no. 2, 990-998, April 2021.
122. Y. Gupta, S. Doolla, K. Chatterjee and B. C. Pal, “Optimal DG Allocation and Volt–var Dispatch for a Droop Based Microgrid”, *IEEE Transactions on Smart Grid*, vol. 12, no 1, 169-181, Jan 2021.
121. H.R. Ali, B. C. Pal , “ Model order reduction of multi-terminal direct-current grid systems,” *IEEE Transactions on Power Systems*, vol. 36, no.1. pp. 699-711, Jan 2021.
120. F. Ul-Nazir, N. Kumar, B. C. Pal, B. Singh and B.K. Panigrahi, “Enhanced SOGI Controller for Weak Grid Integrated Solar PV System,” *IEEE Transactions on Energy Conversion*, vol. 35, no. 3, pp. 1208-1217, Sept. 2020.
119. F. Ul-Nazir, B. C. Pal and R. A. Jabr, “ Distributed Solution of Stochastic Volt/VAr Control in Radial Networks”, *IEEE Transactions on Smart Grid*, vol. 11, no. 6 pp. 5314-5324, Nov 2020.
117. Y Chen, S. M. Mazhari, C.Y. Chung, S. O. Faried and B. C. Pal, “ Rotor Angle Stability Prediction of Power Systems with High Wind Power Penetration Using a Stability Index Vector”, *IEEE Transactions on Power Systems*, vol. 35, no. 6, pp. 4632-4646, Nov 2020.
- 1.
116. J. Nsengiyaremye, B. C. Pal, M. Begovic, “Microgrid Protection Using Low-Cost Communication Systems”, *IEEE Transactions on Power Delivery*, vol. 35, no. 4, pp. 2011-2020, Aug. 2020.
115. O.S Nduka, P. K. Linash , A Majumdar , B. C. Pal , Yue Yu, S. Maiti and A R. Ahmadi , “Field Trial of Coordinated Control of PV and Energy Storage Units and Analysis of Power Quality Measurements,” *IEEE Access*, vol. 8, pp. 1962-1974, 2020.
114. N. R. Meritt, C Chakraborty , P Bajpai, and B. C. Pal, “A Unified Control Structure for Grid Connected and Islanded Mode Operations of Voltage Source Converter based Distributed Generation Units under Unbalanced and Non-linear Conditions”, *IEEE Transactions on Power Delivery*, vol. 35, no. 4, pp. 1758-1768, Aug. 2020.
113. O. S. Nduka, Y. Yu, B. C. Pal and E. N. C. Okafor, “A Robust Augmented Nodal Analysis Approach to Distribution Network Solution,” *IEEE Transactions on Smart Grid*, vol. 11, no. 3, pp. 2140-2150, May 2020.
112. X. He, H. Geng, R. Li and B. C. Pal, “Transient Stability Analysis and Enhancement of Renewable Energy Conversion System During LVRT,” *IEEE Transactions on Sustainable Energy*, vol. 11, no. 3 pp.161-1623, August 2020.
111. L. Zhang, E. Kerrigan and B. C. Pal, “Optimal Communication Scheduling in the Smart Grid”, accepted in *IEEE Transactions in Industrial Informatics*, vol. 15, no. 9, pp. 5257-5265, Sept. 2019.



110. H. Ali, P. K. Linash; and B. C. Pal, V. Konstantin and A. Adamczyk, "A Trajectory Piecewise Linear Approach to Nonlinear Model Order Reduction of Wind Farms" *IEEE Transactions on Sustainable Energy*, vol. 11, no. 2, pp. 894-905, April 2020.
109. G. Anagnostou; P. K. Linash; and B. C. Pal, "Dynamic State Estimation for Wind Turbine Models with Unknown Wind Velocity", *IEEE Transactions on Power Systems*, vol. 34, no. 5, pp. 3879-3890, Sept. 2019.
- 108 S. Kumar, B. Singh, B. C. Pal, L. Xu and A. Al-Durra, "Energy Efficient Three-Phase Utility Interactive Residential Microgrid With Mode Transfer Capabilities at Weak Grid Conditions," *IEEE Transactions on Industry Applications*, vol. 55, no. 6, pp. 7082-7091, Nov-Dec. 2019.
107. Junbo Zhao, Antonio Gomez-Exposito, Marcos Netto, Lamine Mili, Ali Abur, Vladimir Terzija, Innocent Kamwa, Bikash Pal, Abhinav Kumar Singh, Junjian Qi, Zhenyu Huang, A. P. Sakis Meliopoulos, "Power System Dynamic State Estimation: Motivations, Definitions, Methodologies and Future Work", *IEEE Transactions on Power Systems*, vol. 34, no. 4, pp. 3188-3198, July 2019.
106. A. K. Singh and B. C. Pal, "Rate of Change of Frequency Estimation for Power Systems using Interpolated DFT and Kalman Filter", *IEEE Transactions on Power Systems*, vol. 34, no. 4, pp. 2509 - 2517, July 2019.
105. E. Batzelis, G. Anagnostou, I. R. Cole, T. R. Betts and B. C. Pal, "A State-Space Dynamic Model for Photovoltaic Systems with Full Ancillary Services Support," *IEEE Transactions on Sustainable Energy*, vol. 10 no. 3, pp. 1399 - 1409, July 2019.
104. U. Bose, S. Chattopadhyay, C. Chakraborty and B. C. Pal, "A Novel Method of Frequency Regulation in Microgrid", *IEEE Transactions on Industry Applications*, vol. 55, no. 1, pp. 111-121, January 2019.
103. H. Ali, P. K. Linash; and B. C. Pal, A. Adamczyk and V Konstantin, "Model Order Reduction of Wind Farms: Linear Approach" *IEEE Transactions on Sustainable Energy*, vol. 10, no. 3, pp. 1194 - 1205, July 2019.
102. Efstratios I. Batzelis, Georgios Anagnostou and Bikash C Pal, "A State-Space Representation of Irradiance-Driven Dynamics in Two-Stage Photovoltaic Systems", *IEEE journal of Photovoltaics*, vol. 8, no. 4, pp. 1119-1124, July 2018.
101. F. Ul-Nazir, B. C. Pal and R. A. Jabr, "A Two-Stage Chance Constrained Volt/Var Control Scheme for Active Distribution Networks with Nodal Power Uncertainties", *IEEE Transactions on Power Systems*, vol. 34, no. 1, pp. 314-325, January 2019
100. C. Lianfang, N. F. Thornhill, S. Kuenzel, and B. C. Pal, "A Test Model of a Power Grid with Battery Energy Storage and Wide-Area Monitoring", *IEEE Transactions on Power Systems*, vol. 34, no. 1, pp. 380-390, January 2019.
- 99 H. Kazari, H. Oraee and B. C Pal, "Assessing the Effect of Wind Farm Layout on Energy Storage Requirement for Power Fluctuation Mitigation", *IEEE Transactions on Sustainable Energy*, vol. 10, no. 2, pp. 558 - 568, April 2019.
98. Umamaheswararao V, S. Maiti, C. Chakraborty, and B. C. Pal, "Series Voltage Regulator for Radial DC-microgrid", *IEEE Transactions on Sustainable Energy*, vol. 10, no.1, pp. 127-136, January 2019.
97. E I. Batzelis, S. A. Papathanassiou and B. C Pal, "PV System Control to Provide Active Power Reserves under Partial Shading Conditions", *IEEE Transactions on Power Electronics*, vol. 33, no. 11, pp. 9163 - 9175, Nov 2018.
96. A. V. Ravi Teja, C. Chakraborty, and B C. Pal, "Disturbance Rejection Analysis and FPGA based Implementation of a Second Order Sliding Mode Controller fed Induction Motor Drive, *IEEE Transactions on Energy Conversions*, vol. 33, no. 3, pp. 1453-1462, September 2018.
95. S. Ma, H. Geng, G. Yang, B. C. Pal, "Clustering based Coordinated Control of Large Scale Wind Farm for Power System Frequency Support", *IEEE Transactions on Sustainable Energy*, vol. 9, no. 4, pp. 1555-1564, October 2018.
94. A. Singh and B. C. Pal, "Decentralized Robust Dynamic State Estimation in Power Systems using Instrument Transformers", *IEEE Transactions on Signal Processing*, vol. 66, no 6, pp. 1541-1550, March 2018.
93. C. Lianfang; N. F. Thornhill; S. Kuenzel; and B. C. Pal, "Wide-Area Monitoring of Power Systems Using Principal Component Analysis and k-Nearest Neighbor Analysis," *IEEE Transactions on Power Systems*, vol. 33, no. 5, pp.4913-4923, September 2018.

92. O. S. Nduka, and B. C. Pal, "Quantitative Evaluation of Actual Loss Reduction Benefits of a Renewable Heavy DG Distribution Network", *IEEE Transactions on Sustainable Energy*, vol. 9, no. 3, pp. 1384-1396, July 2018.
91. G. Anagnostou, F. Boem, S. Kuenzel, B. C. Pal, and T. Parisini, "Observer based Anomaly Detection of Synchronous Generators for Power System Monitoring," *IEEE Transactions on Power Systems*, vol. 33, no.4, 4228-4237.
90. P. Bhui, N Senroy, A K. Singh, and B C. Pal, "Estimation of Inherent Governor Dead-Band and Regulation Using Unscented Kalman Filter", *IEEE Transactions on Power Systems*, vol. 33, no. 4, 3546-3558, July 2018.
89. S. Basak, C. Chakraborty and B. C. Pal, "A New Configuration of Dual Stator Induction Generator Employing Series and Shunt Capacitors", *IEEE Transactions on Energy Conversions*, vol. 33, no. 2. pp. 762-772, June 2018
88. G. Xuan, S. Kuenzel and B. C. Pal, "Optimal wind farm cabling", *IEEE Transactions on Sustainable Energy*, vol. 9, no. 3, pp. 1126-1136, July 2018.
87. R. A. Jabr, I. Dzafic and B. C. Pal, "Compensation in Complex Variables for Microgrid Power Flow," in *IEEE Transactions on Power Systems*, vol. 33, no. 3, pp. 3207 - 3209, May 2018.
86. A. Majumdar and B. C. Pal, "Bad Data Detection in the Context of Leverage Point Attacks in Modern Power Networks," *IEEE Transactions on Smart Grid*, vol. 9, no. 3, pp. 2042-2054, May 2018.
85. A. Singh and B. C. Pal, "Decentralized Nonlinear Control for Power Systems using Normal Forms and Detailed Models", *IEEE Transactions on Power Systems*, vol. 33, no. 2, March 2018.
84. S. Ma, H. Geng, L. Liu, G. Yang and B. C. Pal, "Grid-Synchronization Stability Improvement of Large Scale Wind Farm During Severe Grid Fault", *IEEE Transactions on Power Systems*, vol. 33, no. 1, pp.216-226, February 2018.
83. A. Majumdar, Y.P. Agalgaonkar, B.C. Pal and R. Gottschalg, "Centralized Volt-Var Optimization Strategy Considering Malicious Attack on Distributed Energy Resources Control," *IEEE Transactions on Sustainable Energy*, vol. 9, no. 1, pp. 148-156, January 2018.
82. G. A. Anagnostou and B. C. Pal, "Derivative-free Kalman filtering based Approaches to Dynamic State Estimation for Power Systems with Unknown Inputs", *IEEE Transactions on Power Systems*, vol. 33, no. 1, pp. 116 - 130 , January 2018.
81. L. P. Kunjumuhammed, B. C. Pal, R. Gupta and K. Dyke, "Stability Analysis of a PMSG Based Large Offshore Wind Farm Connected to an HVDC Line", *IEEE Transactions on Energy Conversions*, vol. 32, no. 3, pp. 1166-1176, Sept. 2017.
80. C. Lianfang; N. F. Thornhill; S. Kuenzel; and B. C. Pal, "Real-time Detection of Power System Disturbances Based on k-Nearest Neighbor Analysis," *IEEE Access* , vol.5, no.1, pp.5631-5639, Dec. 2017.
79. C. Lianfang, N. F. Thornhill and B. C. Pal, "Multivariate Detection of Power System Disturbances Based on Fourth Order Moment and Singular Value Decomposition," *IEEE Transactions on Power Systems*, vol. 32, no. 6, page 4289-4297, November 2017.
78. S. Nanchian, A. Majumdar and B. C. Pal, "Ordinal Optimization Technique for Three Phase Distribution Network State Estimation Including Discrete Variables", *IEEE Transactions on Sustainable Energy*, vol.8, no.4, pp. 1528 - 1535, October 2017.
77. O. S. Nduka, and B. C. Pal, "Harmonic domain modelling of PV system for the assessment of grid integration impact", *IEEE Transactions on Sustainable Energy*, vol. 8, no. 3, pp. 1154 - 1165, July 2017.
76. T. M. L de Assis, S. Kuenzel and B. C. Pal, "Impact of Multi-Terminal HVDC Grids on Enhancing Dynamic Power Transfer Capability ", *IEEE Transactions on Power Systems*, vol. 32, no. 4, pp. 2652 - 2662, July 2017.
75. A Singh and B. C. Pal, "An Extended Linear Quadratic Regulator for LTI Systems with Exogenous Inputs", *Automatica*, vol. 76, pp. 10-16, February 2017.
74. C. Battistelli , Y. P. Agalgaonkar and B. C. Pal, "Probabilistic Dispatch of Remote Hybrid Microgrids Including Battery Storage and Load Management", *IEEE Transactions on Smart Grid*, vol. 8, no. 3, pp. 1305 - 1317, May 2017.

73. I. Dzafic, R. A. Jabr, I. Huseinagic and B. C. Pal, "Multi-Phase State Estimation Featuring Industrial-Grade Distribution Network Models", *IEEE Transactions on Smart Grid*, vol. 8, no. 2, pp. 609 - 618, March 2017.
72. K. P. Schneider, B. A. Mather, B. C. Pal, Fellow, C. -W. Ten, G. J. Shirek, H. Zhu, J. C. Fuller, J. L. R. Pereira, L. F. Ochoa, L. R. de Araujo, R. C. Dugan, S. Matthias, S. Paudyal, T. E. McDermott, W. Kersting, "Analytic Considerations and Design Basis for the IEEE Distribution Test Feeders", *IEEE Transactions on Power Systems*, vol. 32, no. 1, pp. 715 - 722, January 2017.
71. L. P. Kunjumammed, B. C. Pal, C. Oates and K. Dyke, "The Adequacy of the Present Practice in Dynamic Aggregated Modeling of Wind Farm Systems," *IEEE Transactions on Sustainable Energy*, vol. 8, no. 1, pp. 23-32, Jan. 2017.
70. C. Cañizares, T. Fernandes, E. Gerdali Jr., L. Gerin-Lajoie, M. Gibbard, I. Hiskens, J. Kersulis, R. Kuiava, L. Lima, F. De Marco, N. Martins, B. C. Pal, A. Piardi, R. Ramos, J. dos Santos, D. Silva, A. K. Singh, B. Tamimi, and D.Vowles, "Benchmark Models for the Analysis and Control of Small-Signal Oscillatory Dynamics in Power Systems," *IEEE Transactions on Power Systems*, vol. 32, no. 1, pp. 715-722, January 2017.
69. MAM Ariff, B.C.Pal, "Adaptive Protection and Control in Power System for Wide-Area Blackout Prevention," *IEEE Transactions on Power Delivery*, vol. 31, no. 4, 1815-1825, October 2016.
68. J. S. de Stachhini, T. M. L de Assis, and B. C. Pal, "Data Compression in Smart Distribution Systems via Singular Value Decomposition," *IEEE Transactions on Smart Grid*, vol: 8, no. 1, pp. 275 - 284, January 2017.
67. L. P. Kunjumammed, B. C. Pal, C. Oates and K. Dyke, "Electrical Oscillations in Wind Farm Systems: Analysis and Insight Based on Detailed Modelling," *IEEE Transactions on Sustainable Energy*, vol. 7, no. 1, pp. 51 - 62, January, 2016.
66. A. Singh and B. C Pal, "Decentralized Control of Oscillatory Dynamics in Power Systems using an Extended LQR", *IEEE Transactions on Power Systems*, vol. 31, no. 3, 1715-1728, May 2016.
65. G. Anagnostou and B. C. Pal, "Impact of Over excitation Limiters on the Power System Stability Margin Under Stressed Conditions," *IEEE Transactions on Power Systems*, vol. 31, no. 3, 2327-2337, May 2016.
64. Y.P. Agalgaonkar, B. C. Pal and R. A. Jabr, "Stochastic Distribution System Operation Considering Voltage Regulation Risks in the Presence of PV Generation," *IEEE Transactions on Sustainable Energy*, vol. 6, no. 4, pp. 1315 - 1324, October, 2015.
63. S. Nanchian, A. Majumdar and B. C. Pal, "Three Phase State Estimation Using Hybrid Particle Swarm Optimization", *IEEE Transactions on Smart Grids*, Vol: 8, pp. 1035-1045, May 2017.
62. E. M. Lourenco, E. P. R. Coelho, and B. C. Pal, "Topology Error and Bad Data Processing in Generalized State Estimation", *IEEE Transactions on Power Systems*, vol. 30, no. 6, pp. 3190-3200, November, 2015.
61. E. Barocio, B. C. Pal, A. R. Messina and N. Thornhill, "A Dynamic Mode Decomposition Framework for Global Power System Oscillation Analysis", *IEEE Transactions on Power Systems*, vol. 30, no. 6, pp. 2902-2912, November, 2015,
60. L. P. Kunjumammed and B. C. Pal, "Selection of Feedback Signals for Controlling Dynamics in Smart Power Transmission Networks", *IEEE Transactions on Smart Grid*, vol. 6, no. 3, pp. 1493-1501, May 2015.
59. O. L. Tortelli, E. M. Lourenco, A. V. Garcia, and B. C. Pal, "Fast Decoupled Power Flow to Emerging Distribution Systems via Complex pu Normalization", *IEEE Transactions on Power Systems*, vol. 30, no. 3, pp. 1351-1358, May 2015.
58. MAM Ariff, B.C.Pal, and A. Singh, "Estimating Dynamic Model Parameters for Adaptive Protection and Control in Power System", *IEEE Transactions on Power Systems*, vol. 30, no. 2, pp. 829-839, March 2015.
57. R. A. Jabr, I. Džafic and B. C. Pal, "Robust Optimization of Storage Investment on Transmission Networks", *IEEE Transactions on Power Systems*, vol. 30, no. 1, pp: 531-539, January 2015.
56. A. Singh, R. Singh and B. C. Pal, "Stability Analysis of Networked Controlled Power Systems", *IEEE Transactions on Smart Grid*, vol. 6, no. 1, pp: 381-390, January 2015.
55. A. Singh and B. C. Pal, "Decentralized Dynamic State Estimation in Power Systems using Unscented Transformation", *IEEE Transactions on Power Systems*, vol.29, no.2, pp.794-804, March 2014.

54. I. Džafic, R. A. Jabr, E. Halilovic, B. C. Pal “A Sensitivity Approach to Model Local Voltage Controllers in Distribution Networks”, *IEEE Transactions on Power Systems*, vol.29, no.3, pp.1419-1428, May 2014.
53. Y.P. Agalgaonkar, B.C. Pal and R.A. Jabr, “Distribution Voltage Control Considering the Impact of PV Generation on Tap Changers and Autonomous Regulators”, *IEEE Transactions on Power Systems*, vol.29, no.1, pp.182-192, January 2014.
52. I. Džafic, B. C. Pal, M. Gilles, S. Henselmeyer, and S. Sultanic, “Generalized  $\pi$  Fortescue Equivalent Admittance Matrix Approach to Power Flow Solution”, *IEEE Transactions on Power Systems*, vol.29, no.1, pp.193-202, January 2014.
51. S. Kuenzel, L. P. Kunjumammed, B. C. Pal and I. Erlich, “Impact of Wakes on Wind Farm Inertial Response”, *IEEE Transactions on Sustainable Energy*, vol.5, no.1, pp.237-245, January 2014.
50. I. Džafic, M. Gilles, R. A. Jabr, B. C. Pal and S. Henselmeyer, “Real Time Estimation of Loads in Radial and Unsymmetrical Three-Phase Distribution Networks”, *IEEE Transactions on Power Systems*, vol.28, no.4, pp. 4839-4848, November 2013.
49. MAM Ariff and B. C. Pal, “Coherency Identification in Interconnected Power System - An Independent Component Analysis Approach”, *IEEE Transactions on Power Systems*, vol. 28, no. 2, pp. 1747-1756, May 2013.
48. D. Simfukwe and B. C. Pal, “Robust and Low Order Power Oscillation Damper Design Through Polynomial Control”, *IEEE Transactions on Power Systems*. vol. 28, no. 2, pp. 1599-1609, May 2013.
47. E. Manitsas, R. Singh, B. C. Pal and G. Strbac, “Distribution System State Estimation using an Artificial Neural Network Approach for Pseudo Measurement Modeling”, in early access, *IEEE Transactions on Power Systems*, vol. 27, no. 4, pp. 1888-1896, November 2012.
46. R. A. Jabr, R. Singh and B. C. Pal, “Minimum Loss Network Reconfiguration Using Mixed-Integer Convex Programming”, *IEEE Transactions on Power Systems*, vol. 27, no. 2, pp. 1106-1115, May 2012.
45. R. A. Jabr, N. Martins, B. C. Pal, and S. Karaki, “Multiple State Reactive Power Optimization using Penalty Successive Conic Programming”, *IEEE Transactions on Power Systems*, vol. 27, no. 1, pp. 545-553, February 2012.
44. K.R.W. Bell, W. Fenton, H. Griffiths, B. C. Pal and J. R. McDonald, “Attracting Graduates to Power Engineering in the U.K.: Successful University and Industry Collaboration” , *IEEE Transactions on Power Systems*, vol. 27, no. 1, pp. 450-457, February 2012.
43. E. Caro, R. Singh, B.C. Pal, A. Conejo and R. A. Jabr, “An Incremental PMU Placement Method for Power System State Estimation”, *IET Generation, Transmission and Distribution*, vol. 6, no. 9, pp. 922-929, September 2012.
42. L. P. Kunjumammed, R. Singh and B. C. Pal, “Robust Signal Selection for Damping of Inter-area Oscillations”, *IET Generation, Transmission and Distribution*, vol. 6, no. 5, pp. 404-416, May 2012.
41. D. Simfukwe, B. C. Pal, R. A. Jabr and N. Martins, “Robust and Low Order Design of FACTS and Power System Stabilizers for Oscillation Damping”, *IET Generation, Transmission and Distribution*, vol. 6, no. 5, pp. 445-452, May 2012.
40. T. Jukka, J. Thambirajah, Mats Larsson, B. C. Pal, N. F. Thornhill, L. Haarla, W. Hung, A. Carter, and T. Rauhala, “Comparison of Three Electromechanical Oscillation Damping Estimation Methods”, *IEEE Transactions on Power Systems*, vol. 26, no. 4, pp. 2398-2407, November 2011.
39. R. Singh, B. C. Pal, R. A. Jabr, and R. B. Vinter, “Meter Placement for Distribution System State Estimation: An Ordinal Optimization Approach”, *IEEE Transactions on Power Systems* vol. 26, no. 4, pp. 2328-2335, November 2011.
38. J. Thambirajah, N. F. Thornhill, B. C. Pal, “A Multivariate Approach Towards Inter-Area Oscillation Damping Estimation Under Ambient Conditions Via Independent Component Analysis And Random Decrement”, *IEEE Transactions on Power Systems*, vol. 26, no. 1, pp. 315-322, February 2011.
37. R. A. Jabr, B. C. Pal, N. Martins, and J. C. R. Ferraz, “Robust and Coordinated Tuning of Power System Stabiliser Gains using Sequential Linear Programming”, *IET Generation, Transmission and Distribution*, vol. 4, no. 8, pp. 893-904, August 2010.

36. R. A. Jabr, B. C. Pal and N. Martins, "A Sequential Conic Programming Approach for the Coordinated and Robust Design of Power System Stabilizers," *IEEE Transactions on Power Systems*, vol 25, no 3, pp.1627-1637, August 2010.
35. R. Singh, E. Manitsas, B. C. Pal and G. Strbac, "A Recursive Bayesian Approach for Identification of Network Configuration Changes in Distribution System State Estimation", *IEEE Transactions on Power Systems*, vol. 25, no. 3, pp.1329-1336, August 2010.
34. R. Singh, B. C. Pal and R. A. Jabr, "Modeling Pseudo Measurements in Distribution System State Estimation", *IEEE Transactions on Power Systems*, vol. 25, no. 1, pp. 29-37, February 2010.
33. R. Singh, B. C. Pal and R. A. Jabr, "Distribution System State Estimation Through Gaussian Mixture Model of the Load as Pseudo Measurement" *IET Generation, Transmission & Distribution*, vol. 4, no. 1, pp. 50-59, January 2010.
32. R. A. Jabr and B. C. Pal, "Ordinal Optimisation Approach for Locating and Sizing of Distributed Generation," *IET Generation, Transmission & Distribution*, vol. 3, no. 8, pp. 713-723, August 2009.
31. R. Singh, B. C. Pal and R. A. Jabr, "Choice of Estimator for Distribution System State Estimation", *IET Generation, Transmission & Distribution*, vol. 3, no. 7, pp. 666-678, July 2009.
30. R. Singh, B. C. Pal and R. B. Vinter, "Measurement Placement in Distribution System State Estimation", *IEEE Transactions on Power Systems*, vol. 24, no. 2, pp. 668-675, May 2009.
29. D. S. Laila, A. R. Messina and B. C. Pal, "A refined Hilbert-Huang transform with applications to inter-area oscillation monitoring", *IEEE Transactions on Power Systems*, vol. 24, no. 2, pp. 610-625, May 2009.
28. R. A. Jabr and B. C. Pal, "Intermittent Wind Generation in Optimal Power Flow Dispatching," *IET Generation, Transmission & Distribution*, vol. 3, no. 1, pp. 66-74, January 2009.
27. B. C. Pal and F. Mei, "On the modeling Adequacy of the DFIG for Small Signal Stability Studies in Power Systems," *IET Renewable Power Generations*, vol. 2, no. 3, pp. 181-190, September 2008, ***IET RPG best journal paper award in 2008.***
26. R. A. Jabr and B. C. Pal, "AC Network State Estimation Using Linear Measurement Functions", *IET Generation, Transmission & Distribution*, vol. 2, no. 1, pp. 1-6, January 2008.
25. F. Mei and B. Pal, "Modal Analysis of Grid Connected Doubly-Fed Induction Generators," *IEEE Transactions on Energy Conversion*, vol. 22, no. 3, pp. 728-736, September 2007.
24. R. A. Jabr and B. C. Pal, "A Conic Programming Approach for Static Voltage Stability Analysis in Radial Networks", *IET Generation, Transmission & Distribution*, vol. 1, no. 2, pp. 203-208, March 2007.
23. R. Majumder, B. Chaudhuri, and B. C. Pal, "Implementation and test results of a wide area measurement based controller for damping inter-area oscillations considering signal transmission delay", *IET Generation, Transmission and Distribution*, vol. 1, no. 1, pp. 1-7, January 2007.
22. B. Das and B. C. Pal, "A scheme for grid connection of wave energy generation from AWS", *IEEE Transactions on Energy Conversion*, vol. 21, no. 2 pp. 353-361, June 2006.
21. R. Majumder, B. C. Pal, C. Dafour and P. Korba, "Design and real-time implementation of robust FACTS controller for damping inter-area oscillation", *IEEE Transactions on Power Systems*, vol. 21, no. 2, pp. 809-816, May 2006.
20. B. Chaudhuri, P. Korba and B. C. Pal, "Simultaneous stabilization technique for damping controller design in power systems", *Intelligent Automation and Soft Computing*, vol. 12, no. 1 pp. 41-49, January 2006.
19. R. Majumder, B. Chaudhuri, H. El-Zobaidi, B. C. Pal and I. M. Jaimoukha, "LMI approach to normalized H-infinity loop-shaping design of power system damping controllers", *IEE Proc. Generation, Transmission and Distribution*, vol. 152, no. 6, pp. 952-960, November 2005.
18. R. Majumder, B. Chaudhuri, B. C. Pal, and Q. Zhong, "A unified smith predictor approach for power system damping control design using remote signals", *IEEE Transactions on Control Systems Technology*, vol 13, no. 6, pp. 1063-1068, November 2005.

17. A. Krishna, B. Chaudhuri, N. Thornhill, and B. C. Pal, "Coherency Identification in Power Systems through Principal Component Analysis", *IEEE Transactions on Power Systems*, vol. 20, no. 3, pp. 1658-1660, August 2005.
16. A. Krishna, B. C. Pal, and H. El-Zobaidi, "Co-prime factorization approach in designing multi-input stabilizer for damping electromechanical oscillations in power systems", *IEE Proc. Generation, Transmission and Distribution*, vol. 152, no. 3, pp. 301-308, May 2005.
15. R. Majumder, B. Chaudhuri, and B. C. Pal, "A Probabilistic Approach to Model Based Adaptive Control for Damping of Inter-area Oscillations", *IEEE Transactions on Power Systems*, vol. 20, no. 1, pp. 367-374, February 2005.
14. B. Chaudhuri, R. Majumder, and B. C. Pal, "Wide area measurement based stabilizing control of power system considering signal transmission delay", *IEEE Transactions on Power Systems*, vol. 19, no. 4, pp. 1971-1979, November 2004.
13. B. Chaudhuri, R. Majumder, and B. C. Pal, "Application of Multiple-Model Adaptive Control Strategy for Robust Damping of Inter-area Oscillations in Power System", *IEEE Transactions on Control Systems Technology*, vol. 12, no. 5, pp. 727-726, September 2004.
12. B. Chaudhuri and B. C. Pal, "Robust damping of multiple swing modes employing global stabilizing signals with a TCSC," *IEEE Transactions on Power Systems*, vol. 19, no. 1, pp. 499-506, February 2004.
11. R. A. Jabr and B. C. Pal, "Iteratively Reweighted Least Squares Implementation of the WLAV State Estimation Method", *IEE Proc. Generation, Transmission and Distribution*, vol. 151, no. 1, pp. 103-108, January 2004.
10. B. C. Pal, B. Chaudhuri, A.C. Zolotas, and I. M. Jaimoukha, "Simultaneous Stabilisation Approach for Power System Damping Control Design through TCPAR Employing Global Signals," *IEE Proc. Generation, Transmission and Distribution*, vol. 151, no. 1, pp. 43-50, January 2004.
9. G. Andersson, T. Green, B. C. Pal, and C. Rehtanz, "Advanced Control of Flexible AC Transmission Systems," *ABB Review*, no. 4, pp. 21-26, December 2003.
8. B. Chaudhuri, B. C. Pal, A.C. Zolotas, I. M. Jaimoukha, and T.C. Green, "Mixed-Sensitivity Approach to  $H_\infty$  Control of Power System Oscillations Employing Multiple FACTS Devices", *IEEE Transactions on Power Systems*, vol. 18, no. 3, pp. 1149-1156, August 2003.
7. R. A. Jabr and B. C. Pal, "Iteratively Re-weighted Least Absolute Value Method for State Estimation", *IEE Proc. Generation, Transmission and Distribution*, vol. 150, no. 4, pp. 385-391, July 2003.
6. B. C. Pal, "Robust pole placement v/s root-locus approach in the context of damping inter-area oscillations in power systems," *IEE Proc. Generation, Transmission and Distribution*, vol. 149, no. 6, pp. 739-745, November 2002.
5. B. C. Pal, "Robust damping of inter-area oscillations with unified power flow controller", *IEE Proc. Generation, Transmission and Distribution*, vol. 149, no. 6, pp.733-738, November 2002.
4. B. C. Pal, A. H. Coonick, and B. J. Cory, "Linear matrix inequality versus root-locus approach for damping inter-area oscillations in power systems", *International Journal of Electrical Power and Energy Systems*, vol. 23, no. 6, pp. 481-489, August 2001.
3. B. C. Pal, A. H. Coonick, I. M. Jaimoukha, and H. El-Zobaidi, "A Linear Matrix Inequality Approach to Robust Damping Control Design in Power Systems with Superconducting Magnetic Energy Storage Device", *IEEE Transactions on Power Systems*, vol. 15, no. 1, pp. 356-362, February 2000.
2. B. C. Pal, A. H. Coonick, and D.C. Macdonald, "Robust Damping Controller Design in Power Systems with Superconducting Magnetic Energy Storage Device", *IEEE Transactions on Power Systems*, vol. 15, no. 1, pp. 320-325, February 2000.
1. B. C. Pal, A. H. Coonick, and B. J. Cory, "Robust Damping of Inter-area Oscillations in Power Systems with Superconducting Magnetic Energy Storage Devices", *IEE Proc. Generation, Transmission and Distribution*, vol. 146, no. 6, pp. 633-639, November 1999.

## Conferences

1. S. Nanchian, A. Majumdar, B. C. Pal, D. Mobsby and D. Macleman, "Transformer Tap Estimation Using Hybrid Particle Swarm Optimization," *IEEE Power and Energy Society General Meeting*, Washington DC, July 2014, **invited panel paper**.
2. A. Singh and B. C. Pal, "NE-NY (68-bus) Test System for Electromechanical Oscillations Damping," *IEEE Power and Energy Society General Meeting*, Washington DC, July 2014, **invited panel paper**.
3. E. Barocio, B.C. Pal, and A.R. Messina, "Real-time monitoring as enabler for smart transmission grids," *IEEE Power and Energy Society General Meeting*, Detroit, USA, pp.1-8, 24-29 July 2011, doi: 10.1109/PES.2011.6039150, **invited panel paper**.
4. V. Terzija, P. Regulski, L. P. Kunjumammed, L.P., B. C. Pal, G. Burt, I. Abdulhadi, T. Babnik, M. Osborne, W. Hung, "FlexNet wide area monitoring system," *IEEE Power and Energy Society General Meeting*, Detroit, USA, pp.1-7, 24-29 July 2011, doi: 10.1109/PES.2011.6039929, **invited panel paper**.
5. D. Simfukwe and B. C. Pal, "Improving system loading capacity using margin sensitivity and continuation," *Bulk Power System Dynamics and Control (IREP)-VIII*, 2010 IREP Symposium, 2-6 August, 2010, Rio-de Janeiro, Brazil. DOI: 10.1109/IREP.2010.5563251.
6. D. Simfukwe, B. C. Pal, M. Begovic, D. Divan, and Y. Song, "Control of power system static stability using distributed static series compensators," *IEEE Power and Energy Society General Meeting*, Calgary, Canada, 26-30 July 2009, Page(s):1-6. DOI: 10.1109/PES.2009.5275184
7. D. S. Laila, M. Larsson, B. C. Pal and P. Korba, "Nonlinear damping computation and envelope detection using Hilbert transform and its application to power systems wide area monitoring," *IEEE Power and Energy Society General Meeting*, Calgary, Canada, 26-30 July 2009, Page(s):1-7. DOI: 10.1109/PES.2009.5275889.
8. J. D. F. McDonald, B. C. Pal, and Peter D Lang, "Significance of an operational measure of distribution network reliability;" *IEEE Power and Energy Society General Meeting*, Calgary, Canada, 26-30 July 2009, Page(s):1-8. DOI: 10.1109/PES.2009.5275681.
9. D. S. Laila, A. R. Messina, B. C. Pal, "A refined Hilbert-Huang transform with applications to inter-area oscillation monitoring," *IEEE Power and Energy Society General Meeting*, Calgary, Canada, 26-30 July 2009, Page(s):1-1. DOI: 10.1109/PES.2009.5275975.
10. K.R.W. Bell, W. Fenton, H. Griffiths, J. R. McDonald, B. C. Pal, "The power academy in the UK: A successful initiative to attract graduates to the power industry", *IEEE Power and Energy Society General Meeting*, Calgary, Canada, 26-30 July 2009, Page(s):1-8. DOI: 10.1109/PES.2009.5275881.
11. F. Mei and B. C. Pal, "Modeling of doubly-fed induction generator for power system stability study", *IEEE Power and Energy Society General Meeting - Conversion and Delivery of Electrical Energy in the 21st Century*, Pittsburgh, USA, 20-24 July 2008, Page(s):1-7. DOI: 10.1109/PES.2008.4596214, **invited panel paper**.
12. L. Fu, B. C. Pal and B. J. Cory, "Phasor measurement application for power system voltage stability monitoring" *IEEE Power and Energy Society General Meeting - Conversion and Delivery of Electrical Energy in the 21st Century*, Pittsburgh, USA, 20-24 July 2008 Page(s):1-8. DOI: 10.1109/PES.2008.4596089, **invited panel paper**.
13. R. Singh, B. C. Pal, R. A. Jabr, and P. D. Lang, "Distribution System Load Flow Using Primal Dual Interior Point Method", *IEEE Power System Technology and IEEE Power India Conference*, New Delhi, India, 12-15 October, 2008, Page(s): 1-5. DOI: 10.1109/ICPST.2008.4745307
14. J. D. F. McDonald, B. C. Pal and Peter D Lang, "Representation of Distribution System Reliability during Network Restoration and Repair," *IEEE PES General Meeting*, Tampa, USA, 24-27 June, 2007, Page(s) 1-7. DOI: 10.1109/PES.2007.386155.
15. R. Majumder, B. C. Pal, B. Chaudhuri, and P. Korba, "Design and real time implementation of LMI based robust damping controllers for power systems", *IEEE Conference on System of Systems Engineering*, San Antonio, Texas, USA, 16-18 April, 2007, Page(s) 1-7. DOI: 10.1109/SYSOSE.2007.4304325.
16. J. D. F. McDonald and B. C. Pal, "Representing the Risk Imposed by Different Strategies to Distribution System Operation," *IEEE PES General Meeting*, Montreal, Canada, 18-22 June, 2006, Page(s) 1-7. DOI: 10.1109/PES.2006.1709550.

17. R. Majumder, B. Chaudhuri, B. C. Pal and C. Dufour, "Real time dynamic simulator for power system control applications," *IEEE PES General Meeting*, Montreal, Canada, 18-22 June, 2006. Page(s): 1-7. DOI: 10.1109/PES.2006.1709030.
18. F. Mei and B. C. Pal, "Modal Analysis of a Grid Connected Doubly-Fed Induction Generator;" *The 3rd IET International Conference on Power Electronics, Machines and Drives*, Dublin, Ireland, 4-6 April, 2006, Page(s): 611 - 615.
19. F. Mei and B. C. Pal, "Modeling and Small-Signal Analysis of a Grid Connected Doubly-Fed Induction Generator;" *IEEE Power Engineering Society General Meeting*, San Francisco, USA, 12-16 June, 2005, Page(s) 1503-1510. DOI: 10.1109/PES.2005.1489386.
20. R. Majumder, B. Chaudhuri, B. C. Pal, "A probabilistic approach to model based adaptive control of power systems using FACTS devices," *IEEE PES General Meeting*, Denver, 6-10 June, 2004, **best student paper prize**.
21. B. Chaudhuri, P. Korba and B. C. Pal, "Damping controller design through simultaneous stabilization technique;" *World Automation Congress*, Seville, 28 June-1 July, 2004, vol. 3, Page(s).13-18. DOI: 10.1109/WAC.2004.185293.
22. K. K. Anaparthi and B. C. Pal, "Copriime factorization approach to multi-input PSS design for damping SSR and local modes," *International Conference on Power System Technology*, Singapore, 2004, Page(s). 684-689. DOI: 10.1109/ICPST.2004.1460080
23. B. Chaudhuri, B. C. Pal, A.C. Zolotas, I. M. Jaimoukha and T.C. Green, "Mixed-Sensitivity Approach to H-infinity Control of Power System Oscillations Employing Multiple FACTS Devices," *IEEE Power Engineering Society General Meeting*, Toronto, Canada, 13-18 July, 2003, vol. 3, pp. 1673-1679. DOI: 10.1109/PES.2003.1270999.