

JOYDEEP MITRA: Biographical Data

PERSONAL

Present Position: Associate Professor, Electrical Engineering, Michigan State University;

Citizenship: USA.

Marital Status: Married.

Children: Two.

CONTACT INFORMATION

Business Address:

Michigan State University
Electrical & Computer Engineering
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RÉSUMÉ AND CAREER HIGHLIGHTS

Education: Ph.D., Texas A&M University, 1997; B.Tech., Indian Institute of Technology, Kharagpur, 1989.

Experience: 8 years academic, 5 years industry and consulting.

Sponsored Research: 8 federal and industrial grants, totaling \$1,055,000.

Research Award: NSF CAREER AWARD, 2002.

Patent: One.

Technical Publications: 50+

In print/in press: 2 books, 1 book chapter, 11 journal articles, 32 conference articles, 8 research reports.

Teaching: 14 different and diverse Electrical Engineering courses, including laboratory courses.

Teaching Awards and Honors:

Fellow of the Faculty Institute of Excellence in Learning, North Dakota State University, 2002;
Outstanding Assistant Lecturer, Texas A&M University, 1995.

Students Advised:

Graduated: 1 Ph.D. and 9 M.S. (with thesis/report) students;
Currently advising: 1 Ph.D. student.

Professional Society Membership and Service:

Senior Member, IEEE;
Member of IEEE Power Engineering Society, Industry Applications Society and Standards Association;
Officer of IEEE-PES subcommittees, member of several committees, subcommittees and WGs.

Leadership and Synergistic Activities:

Vice-Chair, IEEE-PES Reliability, Risk and Probability Applications Subcommittee;
Associate Director, Electric Utility Management Program, New Mexico State University (2003-08);
Chair, IEEE-PES Student Meetings Subcommittee (2005-07);
Organized and Chaired an IEEE Tutorial (at 3 conferences), Organized and Chaired two Symposia,
Technical Committee Program Chair at IEEE-PES Annual General Meeting 2009; Taught several
Short Courses, Organized Student Activities at several IEEE conferences;
Delivered several invited talks, including a plenary and five panel presentations.

Other Awards:

Three IEEE Working Group Recognition Awards, in 2007 (as WG Chair), 2005 and 2003;
Supervisor of First Prize winner in a Student Poster Contest, 2006.

AREA OF INTEREST

Present Research Focus

- microgrid architecture • power system communication and control architecture
- power system reliability and security, and modes of catastrophic failures

Broad Area

- reliability analysis • distributed energy resources and microgrids • resource and network planning
- industry deregulation • energy market modeling, simulation and analysis • energy risk management
- power flow analysis and optimization • stability analysis • power system control • state estimation

EDUCATION

January 1992 to May 1997

Doctor of Philosophy, Electrical Engineering
Texas A&M University, College Station, TX 77843

July 1985 to May 1989

Bachelor of Technology (Honors), Electrical Engineering
Indian Institute of Technology, Kharagpur 721302, India

ACADEMIC EXPERIENCE

Appointments

Michigan State University, East Lansing, MI 48824

August 2008 to present

Associate Professor, Department of Electrical & Computer Engineering

New Mexico State University, Las Cruces, NM 88003

August 2004 to August 2008

Associate Professor, Klipsch School of Electrical & Computer Engineering

August 2003 to August 2008 (concurrent appointment)

Associate Director, Electric Utility Management Program

August 2003 to August 2004

Assistant Professor, Klipsch School of Electrical & Computer Engineering

North Dakota State University, Fargo, ND 58105

August 2000 to August 2003

Assistant Professor, Department of Electrical & Computer Engineering

Research Projects

Ongoing:

- “A Holistic Approach to Customer-driven Microgrids,” supported by the National Science Foundation.
- Catastrophic Failures of Power Systems;
- Application of Evolutionary Methods in Reliability Analysis and Planning.

Past:

- “Microgrid Architecture and Reliability,” supported by the National Science Foundation;
- “Optimal Resource Deployment in Microgrids,” supported by Sandia National Laboratories;
- “Storage Optimization in Microgrids,” supported by Sandia National Laboratories;
- “Advanced Transformer Modeling for Transients Simulation,” supported by the Bonneville Power Administration;
- “A Real Time Price Signal Driven Demand Management System,” supported by the Otter Tail Power Company;
- “Dynamic Modeling of Large Induction Motors for Stability and Load Flow Studies,” supported by the Otter Tail Power Company;
- “Dynamic Ratings of Transmission Lines, Transformers, Traps and Current Transformers,” supported by the Otter Tail Power Company.

Student Advising

Currently Advising:

- Salem A. A. El-Saiah (Ph.D.);
- Mallikarjuna R. Vallem (Ph.D., all but dissertation, graduating May 2009).

Graduated:

- Shashi B. Patra (Ph.D., May 2007, New Mexico State University);
- Sirisha Tanneeru (M.S., December 2008, New Mexico State University);
- Ramakanth R. Tondupally (M.S., December 2008, New Mexico State University);
- Heidi M. Shray (M.S., December 2007, New Mexico State University);
- Aleen Mohammed (M.S., December 2007, New Mexico State University);
- Yashwant J. Patil (M.S., December 2006, New Mexico State University);
- Ramesh Earla (M.S., August 2005, New Mexico State University);
- Narender Aeron (M.S., May 2004, North Dakota State University);
- Julian Feng (M.S., August 2003, North Dakota State University);
- Ryan D. Retzlaff (M.S., May 2003, North Dakota State University).

Courses Taught

At Michigan State University:

- Power Systems (ECE 423).

At New Mexico State University:

- Power Systems I (EE 332);
- Power Systems II (EE 432/542);
- Power Systems III (EE 493/543);
- Power System Reliability and Risk Assessment (EE 535);
- Power System Relaying (EE 534);
- Energy Economics (EE 490/590); one of four faculty in team-taught course.

At North Dakota State University:

- Power System Protection (ECE 731);
- Power Distribution (ECE 733);
- Machines and Controls Lab (ECE 402);
- Power Systems Design (ECE 433/633);
- Energy Conversion (ECE 331);
- Electrical Engineering II (ECE 303);
- Electrical Engineering Lab I (ECE 306).

At Texas A&M University (as Assistant Lecturer, during Doctoral program):

- Electromechanical Energy Conversion (ELEN 338);
- Electric Circuit Theory and Instrumentation (ELEN 306).

Teaching Honors

Fellow of the Faculty Institute of Excellence in Learning, North Dakota State University, 2002–03;

Outstanding Assistant Lecturer Award, Texas A&M University, 1994–95.

INDUSTRY EXPERIENCE

May 1997 to July 2000

Senior Consulting Engineer

LCG Consulting, 4962 El Camino Real, Suite 112, Los Altos, CA 94022

- Nature of work: Performed proprietary research and development of models and algorithms for generation production and energy market simulation and analysis. Worked on the development of UPLAN-E, an integrated utility planning tool.

- R&D Projects:
 - Developed a model to determine optimal bidding strategies in competitive markets for both energy and ancillary services.
 - Developed a data verification model to identify suspicious data in generation, transmission and load databases.
 - Developed a response surface model for rapid estimation of electricity prices.
 - Developed an energy market risk management model that optimizes energy and derivative portfolios.
 - Built and integrated the uncertainty module, which enables UPLAN-E to simulate random variations in several market and environmental variables.
 - Incorporated in UPLAN-E the ability to assess wheeling charges and take these charges into account while performing market simulations.
 - Developed and integrated in UPLAN-E improved models for unit commitment and dispatch, including loss compensation when using the optional linearized model.
- Training: Participated in workshops and seminars designed to train UPLAN-E user-groups. Instructed user-groups on power market simulation, electric network modeling and use of the UPLAN-E package.

July 1989 to August 1991

Electrical Engineer

The Tata Iron & Steel Company, Jamshedpur 831001, India

- Nature of work: Installation, on-site testing, and commissioning of new electrical equipment in the plant, such as cables, overhead lines, isolators, circuit breakers, relays, metering instruments, inverters, converters, motors, starters (DOL and star-delta), and controllers (both relay logic controllers and programmable logic controllers).
- Major Project: Directed complete electric installation on an Electric Overhead Traction Crane. Installation work included mounting, interconnection, on-site modification and testing, and commissioning of all equipment—two hoist motors, four traction motors, control panels, resistance panels, controller units in operator's cabin, as well as burden weight sensors and instrumentation equipment.

PROFESSIONAL AND COMMUNITY SERVICE

Proposal, Manuscript and Book Review

- Panel Review for the National Science Foundation (2007, 2006 and 2001).
- Review of proposals submitted to the ND-EPSCoR.
- Review of manuscripts submitted for publication in:
 - IEEE Transactions on Power Systems;
 - IEEE Transactions on Power Distribution;
 - IEEE Transactions on Energy Conversion;
 - IEEE Transactions on Power Electronics;
 - European Transactions on Electrical Power;
 - Electric Power Systems Research;
 - Journal of Intelligent and Fuzzy Systems;
 - International Journal for Computation and Mathematics in Electrical and Electronic Engineering;
 - IEEE Power Engineering Society Conferences;
 - IEEE International Symposium on Circuits and Systems;
 - North American Power Symposium.
- Books and book chapters for publishers.
- External reviewer for doctoral students in foreign universities.

Short Courses

- Taught a short course on *Electric Power System Reliability Evaluation* at the Indian Institute of Technology, Kharagpur, January 9–12, 2006. 16 hours of instruction. Co-Instructor: C. Singh, Texas A&M University.
- Team-taught a short course on Life Extension of Substations at New Mexico State University, Las Cruces, August 10–11, 2006. Co-Instructor: Gene Wolf, Public Service Company of New Mexico.
- Team-taught a short course on Fundamentals of Electric Power System Analysis at New Mexico State University, Las Cruces, **twice**: August 13–15, 2007 and August 7–9, 2006. Co-Instructors: H. A. Smolleck, S. J. Ranade, New Mexico State University.

Organizer

- Technical Committee Program Chair for the Power System Analysis, Computing and Economics Committee at the IEEE-PES Annual General Meeting, Calgary, Alberta, July 26–30, 2009.
- Organized and Chaired the 39th Annual *North American Power Symposium*, Las Cruces, NM, September 30 to October 2, 2007.
- Organized and Chaired a panel on *Power System Hardening Through Microgrids* at the IEEE-PES Annual General Meeting—2007, Tampa, FL, on June 27, 2007.
- Organized and Chaired the IEEE Tutorial on *Electric Delivery System Reliability Evaluation* at the IEEE-PES Annual General Meeting—2006, Montreal, Quebec, on June 21, 2006 and at the IEEE-PES Annual General Meeting—2005, San Francisco, CA, on June 12, 2005.
- Organized and Chaired the IEEE Tutorial on *Reliability of Electric Delivery Systems* at the IEEE-PES Transmission and Distribution Conference and Exposition—2006, Dallas, TX, on May 21, 2006.
- Organized Student Programs at several IEEE-PES Conferences.
- Organized the Distributed and Renewable Energy Symposium (DRES 2003) at New Mexico State University on December 4, 2003.

Session Chair

- Paper session on *Distributed Generation*, International Conference on Power Systems—2007, Bangalore, India, Dec 2007.
- Paper session on *Advanced Circuits Development and Applications*, the 5th WSEAS International Conference on Circuits, Systems, Electronics, Control & Signal Processing, Dallas, TX, Nov 2006.
- Paper session on *Electric Power Industry Restructuring I*, North American Power Symposium, Carbondale, IL, September 2006.
- Paper session on *Distribution Systems I*, North American Power Symposium, Ames, IA, October 2005.
- Paper session on *Power System Analysis, Modeling and Simulation*, North American Power Symposium, Moscow, ID, August 2004.
- Paper session on *Electromagnetic Transients: Modeling and Simulation*, IEEE-PES General Meeting, Denver, June 2004.
- Paper session on *Power System Reliability Assessment*, IEEE-PES Summer Meeting, Chicago, July 2002.

Invited Talks

- *The National Science Foundation and Its Quest for Tomorrow's Academic Leaders*. Panel Presentation at the *IEEE-PES Annual General Meeting*, Pittsburgh, PA, July 24, 2008 and at the *Power System Conference and Exposition*, Seattle, WA, March 17, 2009.
- *Application of Computational Intelligence in Optimal Expansion of Distribution Systems*. Panel Presentation at the *IEEE-PES Annual General Meeting*, Pittsburgh, PA, July 23, 2008.
- *Microgrid Evolution: New Paradigms Drive New Architectures*. Panel presentation at the *IEEE-PES Transmission and Distribution Conference and Exposition*, Chicago, IL, April 24, 2008.
- *Secure Power Delivery Through Autonomous Microgrids*. Presented at Department of Electrical Engineering, Indian Institute of Technology, Kharagpur, Jan 15, 2008 and at Department of Electrical Engineering, Indian Institute of Technology, Kanpur, Jan 10, 2008.

- *Secure Power Systems Through Autonomous Microgrids*. Plenary presentation at the 5th WSEAS International Conference on Circuits, Systems, Electronics, Control & Signal Processing, Dallas, TX, Nov 1, 2006.
- *Toward Understanding Catastrophic Failure Modes in Power Systems*. Panel presentation at the IEEE-PES Transmission and Distribution Conference and Exposition, Dallas, TX, May 22, 2006.
- *A Self-Supporting Microgrid Achievable with Today's Technology*. Panel presentation at the IEEE-PES Transmission and Distribution Conference and Exposition, Dallas, TX, May 22, 2006.
- *Preventing Catastrophic Failures in Power Systems*. Presented at the Workshop on Power System Security, sponsored by the Ministry of Power, India. Kharagpur, January 13–14, 2006.
- *Economics and Impact of Distributed Generation*. Presented before the Red River Valley Section of the IEEE, October 2002.
- *Reliability of Distributed Energy Resources*. Presented at the Department of Electrical Engineering, University of Manitoba, Winnipeg, October 2002.
- *How Does Electricity Deregulation Affect Us?* Presented before the Rough Rider Kiwanis (Fargo Chapter of the Kiwanis International), November 2000.
- *Reliability Analysis of Interconnected Power Systems*. Presented at the Department of Electrical Engineering, Indian Institute of Technology, Kharagpur, August 1995.
- *Power System Reliability*. Presented at the Electrical Power Department, Tata Iron & Steel Company, Jamshedpur, India, August 1995.

University Service

- Member, Graduate Admissions Recruiting and Financial Aid Committee, ECE Department, Michigan State University, 2008–present
- Member, Graduate Studies Committee, ECE Department, New Mexico State University, 2005–08.
- Member, Technology Committee, ECE Department, New Mexico State University, 2006–08.
- Chair, Ph.D. Qualifying Examination Coordination Committee, ECE Department, New Mexico State University, 2007; member since 2006.
- Member, Faculty Search Committee, ECE Department, New Mexico State University, 2006–07.
- Member, Associate Dean (Academic) Search Committee, College of Engineering, NMSU, 2005.
- Member, Curriculum Committee, ECE Department, North Dakota State University, 2000–01.
- Member, Graduate Committee, ECE Department, North Dakota State University, 2001–03.
- Coordinator for Graduate Seminars, ECE Department, North Dakota State University, 2002–03.

PROFESSIONAL SOCIETY & COMMITTEE MEMBERSHIP

Senior Member, [Institute of Electrical and Electronics Engineers \(IEEE\)](#).

- *Member, IEEE Power Engineering Society*; IEEE-PES Committee affiliations:
 - *Member, Power Systems Analysis, Computing, and Economics (PSACE) Committee*.
 - *Vice-Chair, Reliability, Risk, and Probability Applications (RRPA) Subcommittee*;
 - *Secretary, Reliability, Risk, and Probability Applications (RRPA) Subcommittee (2002–06)*;
 - *Member, Intelligent Systems Subcommittee (2007–present)*;
 - *Member, IEEE Standard 762 Task Force (2002–06)*;
 - *Member, IEEE Standard 859 Task Force*.
 - *Member, IEEE-PES Power Systems Education Committee (PEEC)*.
 - *Chair, Student Activities Subcommittee (2005–07)*;
 - *Vice-Chair, Student Activities Subcommittee (2003–05)*;
 - *Secretary, Student Activities Subcommittee (2001–03)*;
 - *Member, Research Subcommittee*;
 - *Member, Lifelong Learning Subcommittee*.
- *Member, IEEE-PES History Committee*.
- *Member, IEEE Industry Applications Society*.
- *Member, IEEE Standards Association*.

AWARDS & HONORS

Awards

- IEEE Power Engineering Society Technical Committee Working Group Recognition Award (as *Chair* of the Electric Delivery System Reliability Tutorial Working Group), in June 2007.
- Supervisor of First prize winner in Student Poster Contest at the IEEE Power Systems Conference & Exposition 2006, Atlanta, GA, October 2006.
- IEEE-PES Technical Committee Working Group Recognition Award (as member of the IEEE Standard 762 Working Group), in August 2005.
- IEEE-PES Technical Committee Working Group Recognition Award (as member of the Power Engineering Education Committee's Student Meeting Subcommittee), in August 2003.
- The **NSF Career Award**, 2002.
- The **1994–95 Outstanding Assistant Lecturer Award** (Department of Electrical Engineering, Texas A&M University), April 1995.
- The **Jagadis Bose National Science Talent Search Scholarship** (India), July 1985 to June 1989.

Honors

- **Senior Member, IEEE**, 2002.
- **Fellow** of the **Faculty Institute of Excellence in Learning** (North Dakota State University), 2002.

RESEARCH GRANTS

1. Co-PI (with S. J. Ranade, S. Suryanarayanan, P. Ribeiro), "A Holistic Approach to Customer-driven Microgrids," National Science Foundation Grant ECCS-0702208, \$450,000; 2007–10.
2. Principal Investigator, SURP Grant, Sandia National Laboratories, \$40,000; 2006–07.
3. Principal Investigator, SURP Grant, Sandia National Laboratories, \$40,000; 2005–06.
4. Principal Investigator, NSF Career Grant ECS-0134598, \$375,000; 2002–07 (extended at no cost to 2008).
5. Principal Investigator (co-PI: Don L. Stuehm), "Advanced Transformer Modeling for Transients Simulation," Bonneville Power Administration, \$60,000; 2002–03.
6. Principal Investigator (co-PI: Don L. Stuehm), "A Real Time Price Signal Driven Demand Management System," Otter Tail Power Company, \$60,000; 2001–03.
7. Principal Investigator (co-PI: Don L. Stuehm), "Dynamic Modeling of Large Induction Motors for Stability and Load Flow Studies," Otter Tail Power Company, \$15,000; 2001–02.
8. Principal Investigator (co-PI: Don L. Stuehm), "Dynamic Ratings of Transmission Lines, Transformers, Traps and Current Transformers," Otter Tail Power Company, \$15,000; 2001–02.

PATENT

"Standby Generator Integration System," with J. A. Jorgenson, D. L. Stuehm and T. Shaner. US Patent No. 7,180,210, granted February 20, 2007.

TECHNICAL PUBLICATIONS

Ph.D. Dissertation

"Models for Reliability Evaluation of Multi-Area and Composite Systems," published by *ProQuest Information and Learning*, Ann Arbor, MI; 1997.

Books and Book Chapters

- [1] "IEEE Tutorial on Electric Delivery System Reliability Evaluation." IEEE, 2005. Publication number 05TP175. (Editor and chapter co-author.)
- [2] "IEEE Standard Definitions for Use in Reporting Electric Generating Unit Reliability, Availability and Productivity." IEEE Standard 762-2006. (Co-author.)
- [3] "Emergency Power Supply," with C. Singh, the *Wiley Encyclopedia of Electrical and Electronics Engineering* (editor: J. G. Webster), Vol 7, pp 61–67. Wiley, New York, NY; 1999.

Refereed Journal Papers

- [1] "A Direct Method for Determination of Failure Frequency Indices Using State Space Decomposition," with C. Singh, *WSEAS Transactions on Systems*, Vol 6, No 2, pp 243–250, Feb 2007.
- [2] "Hybrid Transformer Model for Transient Simulation: Part I—Development and Parameters," with B. A. Mork, F. Gonzalez, D. Ischenko and D. L. Stuehm, *IEEE Transactions on Power Delivery*, Vol 22, No 1, pp 248–255, Jan 2007.
- [3] "Hybrid Transformer Model for Transient Simulation: Part II—Laboratory Measurements and Benchmarking," with B. A. Mork, F. Gonzalez, D. Ischenko and D. L. Stuehm, *IEEE Transactions on Power Delivery*, Vol 22, No 1, pp 256–262, Jan 2007.
- [4] "Reliability-Specified Generation and Distribution Expansion in Microgrid Architectures," with S. B. Patra, S. J. Ranade and M. R. Vallem, *WSEAS Transactions on Power Systems*, Vol 1, No 8, pp 1446–1453, Aug 2006.
- [5] "Pruning and Simulation for Determination of Frequency and Duration Indices of Composite Systems," with C. Singh, *IEEE Transactions on Power Systems*, Vol 14, No 3, pp 899–905, Aug 1999.
- [6] "Capacity Assistance Distributions for Arbitrarily Configured Multi-Area Networks," with C. Singh, *IEEE Transactions on Power Systems*, Vol 12, No 4, pp 1530–1535, Nov 1997.
- [7] "Composite System Reliability Evaluation using State Space Pruning," with C. Singh, *IEEE Transactions on Power Systems*, Vol 12, No 1, pp 471–479, Feb 1997.
- [8] "Incorporating the DC Load Flow Model in the Decomposition-Simulation Method of Multi-area Reliability Evaluation," with C. Singh, *IEEE Transactions on Power Systems*, Vol 11, No 3, pp 1245–1254, Aug 1996.
- [9] "Reliability Analysis of Emergency and Standby Power Systems," with C. Singh, *IEEE Industry Applications Society Magazine*, Vol 3, No 5, pp 41–47, Sep/Oct 1997.
- [10] "New Architectures for Space Power Systems," with M. Ehsani, M. O. Bilgic and A. D. Patton, *IEEE Aerospace and Electronic Systems Magazine*, Vol 10, No 8, pp 3–8, Aug 1995.
- [11] "Magnetically Inflatable SPS with Energy Storage Capability," with M. Ehsani, M. O. Bilgic and A. D. Patton, *IEEE Aerospace and Electronic Systems Magazine*, Vol 10, No 8, pp 9–14, Aug 1995.

Conference Proceedings Papers

- [1] "A Particle Swarm-based Method for Reliability-driven DG Deployment and Feeder Augmentation in Microgrids," with M. R. Vallem, Proceedings of the 15th *National Power System Conference*, Mumbai, India, December 16–18, 2008.
- [2] "Reliability-oriented Distribution System Expansion and DG Deployment Using a Dynamic Programming Based Method," with M. R. Vallem, Proceedings of the 16th *Power System Computation Conference*, Glasgow, Scotland, July 14–18, 2008.
- [3] "Application of Computational Intelligence in Optimal Expansion of Distribution Systems," (Panel Paper) Proceedings of the *IEEE-PES Annual General Meeting*, Pittsburgh, PA, July 20–24, 2008.
- [4] "The National Science Foundation and Its Quest for Tomorrow's Academic Leaders," (Panel Paper) Proceedings of the *IEEE-PES Annual General Meeting*, Pittsburgh, PA, July 20–24, 2008.
- [5] "A Reliability-based Method for Optimal Deployment of Distributed Generation in Microgrids," with M. R. Vallem and S. J. Ranade, Proceedings of the *International Conference on Power Systems—2007*, Bangalore, India, Dec 12–14, 2007.
- [6] "Effect of Large Induction Motors on the Transient Stability of Power Systems," with S. Tanneeru, Y. J. Patil and S. J. Ranade, Proceedings of the 39th *Annual North American Power Symposium*, Las Cruces, NM, Sep 30–Oct 2, 2007, pp 231–236.
- [7] "Likelihood of Islanding in Distribution Feeders with Photovoltaic Generation," with S. J. Ranade, D. R. Sagi, R. Mulpuri and R. Surabhi, Proceedings of the *IEEE-PES Annual General Meeting*, Tampa, FL, June 24–28, 2007.

- [8] "Power System Hardening through Autonomous, Customer-driven Microgrids," with S. J. Ranade, (Panel Paper), Proceedings of the *IEEE-PES Annual General Meeting*, Tampa, FL, June 24–28, 2007.
- [9] "Determination of Failure Frequency Indices from State Space Decomposition," with C. Singh, Proceedings of the 5th *WSEAS International Conference on Circuits, Systems, Electronics, Control & Signal Processing*, Dallas, TX, Nov 1–3, 2006, pp 230–235.
- [10] "Optimization of Generation and Distribution Expansion in Microgrid Architectures," with S. B. Patra, M. R. Vallem and S. J. Ranade, Proceedings of the 6th *WSEAS International Conference on Power Systems*, Lisbon, Portugal, Sep 22–24, 2006, pp 14–21.
- [11] "Reliability Evaluation and Need-Based Storage Assessment for Surety Microgrids," with M. R. Vallem and D. R. Jensen, Proceedings of the 38th annual *North American Power Symposium*, Carbondale, IL, Sep 17–19, 2006.
- [12] "Reliability Stipulated Microgrid Architecture Using Particle Swarm Optimization," with S. B. Patra and S. J. Ranade, Proceedings of the 9th *International Conference on Probabilistic Methods Applied to Power Systems*, Stockholm, Sweden, June 11–15, 2006.
- [13] "A Probabilistic Search Method for Optimal Resource Deployment in a Microgrid," with M. R. Vallem and S. B. Patra, Proceedings of the 9th *International Conference on Probabilistic Methods Applied to Power Systems*, Stockholm, Sweden, June 11–15, 2006.
- [14] "Designing a Sufficient Reactive Power Supply Scheme to Multi-Islands in a Microgrid," with S. A. Al-Askari and S. J. Ranade, Proceedings of the *IEEE-PES Annual General Meeting*, Montreal, Canada, June 18–22, 2006.
- [15] "A Self-Supporting Microgrid Architecture Achievable with Today's Technology," with S. J. Ranade, (Panel Paper), Proceedings of the *Transmission and Distribution Conference and Exposition*, Dallas, TX, May 21–24, 2006, p 935.
- [16] "Distributed Generation Placement for Optimal Microgrid Architecture," with M. R. Vallem and S. B. Patra, Proceedings of the *IEEE-PES Transmission and Distribution Conference and Exposition*, Dallas, TX, May 21–24, 2006, pp 1191–1195.
- [17] "A New Intelligent Search Method for Composite System Reliability Analysis," with S. B. Patra and R. Earla, Proceedings of the *IEEE-PES Transmission and Distribution Conference and Exposition*, Dallas, TX, May 21–24, 2006, pp 803–807.
- [18] "Sizing and Siting of Distributed Generation for Optimal Microgrid Architecture," with M. R. Vallem, Proceedings of the 37th annual *North American Power Symposium*, Ames, IA, Oct 23–25, 2005, pp 611–616.
- [19] "Optimal Allocation of Shunt Capacitors Placed in a Microgrid Operating in the Islanded Mode," with S. A. Al-Askari and S. J. Ranade, Proceedings of the 37th annual *North American Power Symposium*, Ames, IA, Oct 23–25, 2005, pp 406–411.
- [20] "A Dynamic Programming Based Method for Developing Optimal Microgrid Architectures," with S. B. Patra and S. J. Ranade, Proceedings of the 15th *Power System Computation Conference*, Liege, Belgium, Aug 22–26, 2005.
- [21] "Microgrid Architecture: A Reliability Constrained Approach," with S. B. Patra and S. J. Ranade, Proceedings of the *IEEE-PES Annual General Meeting*, San Francisco, CA, June 12–16, 2005, Vol 3, pp 2372–2377.
- [22] "Identification of Chains of Events Leading to Catastrophic Failures of Power Systems," with S. J. Ranade and R. Kolluru, Proceedings of the *IEEE International Symposium on Circuits and Systems — 2005*, Kobe, Japan, May 23–26, 2005, pp 4187–4190.
- [23] "A Particle Swarm Based Method for Composite System Reliability Analysis," with R. Earla and S. B. Patra, Proceedings of the 36th annual *North American Power Symposium*, Moscow, ID, Aug 8–10, 2004, pp 294–298.

- [24] "Recent Experience with Directed Mentoring and Laboratory Development in the Electric Power Area," with S. J. Ranade and H. A. Smolleck, Proceedings of the *2004 American Society for Engineering Education Annual Conference & Exposition*.
- [25] "Applications of Reliability Analysis to Power Electronics Systems," with C. Singh and P. N. Enjeti, Proceedings of the *India International Conference on Power Electronics*, Mumbai, India, Dec 2002.
- [26] "Integration of Standby Generators into Distributed Generation Systems," with J. Feng and R. Mascarenhas, Proceedings of the 34th annual *North American Power Symposium*, Tempe, Arizona, Oct 2002, pp 269–273.
- [27] "A Hybrid Approach to Addressing the Problem of Noncoherency in Multi-Area Reliability Models," with C. Singh, Proceedings of the 12th *Power System Computation Conference*, Dresden, Germany, Aug 1996, pp 1011–1017.
- [28] "Monte Carlo Simulation for Reliability Analysis of Emergency and Standby Power Systems," with C. Singh, Proceedings of the 30th *IEEE Industry Applications Society Conference*, Orlando, Florida, Oct 1995, pp 2290–2295.
- [29] "A Comparison of Two Hybrid Methods for Multi-Area Reliability Analysis," with C. Singh, Proceedings of the *International Conference on Electrical Engineering*, Matsue, Japan, Jul/Aug 1997.
- [30] "A Diakoptic Formulation of the Economic Power Flow Problem," with L. Roy, Proceedings of the 27th annual *North American Power Symposium*, Bozeman, Montana, Oct 1995, pp 159–162.
- [31] "A Survey of Methods of Forming Reduced Order Equivalents for Energy Function Analysis," Proceedings of the 27th annual *North American Power Symposium*, Bozeman, Montana, Oct 1995, pp 231–234.
- [32] "Combining Textbook Material and Current Research in a Graduate Course in Energy Systems," with M. Ehsani, et al, Proceedings of the annual conference of the *Energy Conversion and Conservation Division* of the ASEE, Anaheim, California, Jun 1995, pp 1845–1851.

Research Reports

- [1] "Optimal Resource Deployment in a Microgrid," a report submitted to the Sandia National Laboratories, Oct 2007.
- [2] "Storage Optimization in a Microgrid," a report submitted to the Sandia National Laboratories, Oct 2006.
- [3] "Advanced Transformer Modeling for Transients Simulation. Tasks 4, 5 and 6: Additional Laboratory Testing for Parameter Refinement," a report submitted to the Bonneville Power Administration, Sep 2003.
- [4] "Advanced Transformer Modeling for Transients Simulation. Task 3: Frequency Dependence of Parameters of 3-leg and 5-leg Distribution Transformers," with R. D. Mascarenhas and M. A. Jayachandran, a report submitted to the Bonneville Power Administration, Sep 2003.
- [5] "Advanced Transformer Modeling for Transients Simulation. Task 2: Library of Model Topologies," with B. A. Mork and F. Gonzalez-Molina, a report submitted to the Bonneville Power Administration, Jun 2003.
- [6] "Advanced Transformer Modeling for Transients Simulation. Task 1: Laboratory Testing of 3-leg and 5-leg Distribution Transformers," a report submitted to the Bonneville Power Administration, Dec 2002.
- [7] "Dynamic Rating of Transmission Lines, Transformers, Traps and Current Transformers," with D. L. Stuehm, a report submitted to the Otter Tail Power Company, Jun 2002.
- [8] "Tools and Data for the Analysis of the Impact of the California Power Exchange and the Independent System Operator on the California and Regional Power Market," with R. Albert, a report submitted to the Sacramento Municipal Utility District, Oct 1997.

Last updated February 2009