

# Mohammed Ben-Idris (Benidris)

University of Nevada, Reno, Electrical & Biomedical Engineering  
1664 N. Virginia Street Reno, NV 89557  
Email: [mbenidris@unr.edu](mailto:mbenidris@unr.edu)  
Phone: +1 775 784 6929  
Web: <https://wolfweb.unr.edu/homepage/mbenidris/>

---

## SUMMARY VITAE

**Present Position:** Assistant Professor, [University of Nevada, Reno](#)

### Education:

- Ph.D. in Electrical, [Michigan State University](#), December 2014
- M.Sc. in Electrical, [University of Benghazi \(formerly: Garyounis University\)](#), Libya, May 2005
- B.Sc. in Electrical, University of Benghazi, Libya, December 1998

**Other Certifications:** Certification in College Teaching, Michigan State University and Certificate in Effective College Instruction, Association of College and University Educators (ACUE) in collaboration with the American Council on Education (ACE)

### Area of interest:

Power system reliability, stability, security and resilience, smart grid, microgrid control cyber-physical energy systems, parallel computation, integration of renewable energy sources.

### Publications:

15 Journal publications, 64 Conference papers, 3 Book chapters

**Patents:** 1 patent; October 9, 2018

### Academic Experience:

- Assistant Professor, University of Nevada, Reno, (July 2016 – Present)
- Research Associate & Visiting Lecturer, Michigan State University, (Jan. 2015 – June 2016)
- Lecturer, University of Benghazi, Libya, (May 2005 – August 2008)

### Industrial Experience:

- General Electric Company of Libya (GECOL), (January 1999 – May 2005)

### Leadership Activities:

- Chair, IEEE Northern Nevada Section
- Chair, IEEE Taskforce on Power System Resilience Metrics and Evaluation Methods
- Director, Energy Reliability, Security, Stability, Resilience & Efficiency (E-RESILIENCE) Research Laboratory

### Grantsmanship Experience:

- NSF CAREER Award: 03/01/2019–02/29/2024; \$500,000
- NSF CAREER Supplement: 01/01/2020–06/30/2020; \$55,000
- Co-PI; DOE; Optimization of Excess Solar and Storage Capacity for Grid Services; \$3000,000; 3 years starting 2020

### Awards:

- Five teaching awards, IEEE chapter, University of Nevada, Reno, 2017, 2018, and 2019
- Two professional development awards, IEEE Region 6, 2017 and 2018
- Grad Assistantship, Michigan State University, teaching ECE 345, Fall 2014
- Scholarship, High Performance Computing, [University of Iowa Summer School](#), Summer 2013
- Outstanding Research Performance, Michigan State University, Spring 2012

## DETAILED VITAE

### RESEARCH AREA OF INTEREST

Electric Power and Energy Systems

Present Research Focus

- Resilience and Reliability Enhancement of Cyber-physical Energy Systems
- Dynamic Clustering of Excess Solar and Storage Capacity for Grid Services
- Microgrid Stability and Control
- Power System Reliability and Security

Broad Area

- Power system reliability, stability, security and resilience
- Microgrid control
- Integration of renewable energy sources
- Reliability of power electronic converters
- Reduction of emissions from power generation
- Developing Power flow models
- Parallel Computations

### EDUCATION

**Doctor of Philosophy**, Electrical Engineering (September 2009 – December 2014)

[Michigan State University](#), East Lansing, MI

Dissertation: “Applications of Sensitivity Analysis in Planning and Operation of Modern Power Systems”

Advisor: Prof. Joydeep Mitra

**Master of Science**, Electrical Engineering (September 2001 – May 2005)

[University of Benghazi \(formerly known as Garyounis University\)](#), Benghazi, Libya

Thesis: “High Voltage Direct Current Power Transmission”

Advisors: Prof. Abdulghader Al-Jaleel and Prof. Abdulhafid Al-Faituri

**Bachelor of Science**, Electrical Engineering (September 1993 – December 1998)

[University of Benghazi](#), Benghazi, Libya

Final Project: “Transient Modeling of a Steam Turbine Driven Generator”

Advisors: Prof. Mohammed Boamoud and Prof. Mohammed Elmusrati

### ACADEMIC EXPERIENCE

- **Appointments**

[University of Nevada, Reno](#), Reno, NV (July 2016 – Present)

**Assistant Professor**, [Department of Electrical and Biomedical Engineering](#)

[Michigan State University](#), East Lansing, MI (January 2015 – June 2016)

**Research Associate**, [Department of Electrical & Computer Engineering](#)

**Visiting Lecturer**, Department of Electrical & Computer Engineering (ECE)

**Associate Director**, [Energy Reliability & Security \(ERiSe\)](#) Research Laboratory

[Michigan State University](#), East Lansing, MI (September 2009 – December 2014)

**Research & Teaching Assistant**, ECE Department

[University of Benghazi](#), Benghazi, Libya (May 2005 – August 2008)

**Lecturer**, Department of Electrical and Electronic Engineering

**Chair**, Engineering Departments of Elmaraj branch, University of Benghazi

**Consultant**, Engineering Research and Libyan Standards Center

[University of Benghazi](#), Benghazi, Libya (September 2001 – April 2005)

**Teaching Assistant**, Department of Electrical and Electronic Engineering

- **Funded Research Projects**

[University of Nevada, Reno](#)

**Reliability and Resilience Assurance of Cyber-Physical Energy Systems.**

NSF CAREER Award (04/01/2019–03/31/2024; \$500,000). The overall objectives of this project are to (1) develop methods to model propagations of failures and attacks through system layers; and (2) determine key factors and establish algorithmic solutions that help prevent future power grids from catastrophic failures.

**Optimization of Excess Solar and Storage Capacity for Grid Services.**

DOE Grant (04/01/2020–03/31/2023; \$5M). This project is led by NV Energy. This project will advance utility demand response (DR) operations through coordination and integration of behind-the-meter (BTM) photovoltaic systems (PV) and energy storage (ES) via novel machine learning software applications embedded in a distributed control architecture. The project seeks to unleash the capability of these distributed energy resource (DER) types to provide more flexible and faster acting grid services.

[Michigan State University](#) (October 2012 – March 2016)

**A Lyapunov Function Based Remedial Action Screening Tool Using Real-Time Data**, supported by US Department of Energy; \$1.85M; lead PI Prof. Joydeep Mitra. The objectives of this project were (i) to develop a composite Lyapunov function based method of transient stability analysis that can be solved at real-time speed without the use of massively parallel computation resources, and (ii) to apply the developed method to perform remedial action screening at real-time speed.

- **Mentoring and Student Advising**

[University of Nevada, Reno](#)

Md Kamruzzaman (PhD., January 2017 – present)

Michael Abdelmalak (PhD., August 2018 – present)

Narayan Bhusal (PhD., January 2019 – present)

Mukesh Gautam (PhD., August 2019 – present)

Michelle Falcon Mujica (MSc., January 2019 – present)

Michael Reed (BSc., August 2017 – May 2018)

Benjamin Fritz (BSc., January 2019 – present)

Rachael Young (BSc., August 2019 – present)

Matthew Egan (BSc., August 2019 – present)

David Nichols (BSc., August 2019 – present)

Antonio Robles (BSc., August 2019 – present)

Jonathon Stauffer (BSc., August 2019 – present)

**University of Benghazi**

Mohammed Ismail (BSc., January 2005 – December 2005)

Mohammed Elsaid (BSc., January 2005 – December 2005)

Mohammed Al-Hony (BSc., January 2005 – December 2005)

Ahmad Hammuda (BSc., January 2006 – December 2006)

Marwan Lemhabrish (BSc., January 2006 – December 2006)

• **Courses Taught**

At University of Nevada, Reno:

- \* EE 362: Signals and Systems: Fall 2016, Fall 2017, Spring 2018, Fall 2018, Spring 2019, and Spring 2020.
- \* EE 791N: Power System Stability and Control
- \* EE 221: Circuits II: Fall 2019
- \* EE 645/EE 445: Power System Operation and Control with Renewable Energy Sources: Spring 2017

Online:

- \* Resilient Controls for the Power Grid; led by University of Idaho and Idaho National Laboratory (INL); Fall 2018 and Fall 2019

At Michigan State University (Visiting Lecturer):

- \* ECE 345 Electronic Instrumentation and Systems: Spring 2015 – Spring 2016

At Michigan State University (Teaching Assistant):

- \* ECE 345 Electronic Instrumentation and Systems: Fall 2014

At University of Benghazi (Lecturer):

- \* EE 211 Circuits and Systems I: Fall 2005 – Spring 2008
- \* EE 212 Circuits and Systems II: Fall 2005 – Spring 2008
- \* EE 281 Circuits and Systems Lab I: Fall 2006 – Spring 2007
- \* EE 282 Circuits and Systems Lab II: Fall 2006 – Spring 2007
- \* EE 384 Electric Machines Lab: Fall 2005 – Spring 2008
- \* EE 494 Power System Lab: Spring 2007 & Spring 2008
- \* EE 486 Engineering Reliability: Fall 2007 – Spring 2008

At University of Benghazi (Teaching Assistant):

- \* EE 384 Electric Machines Lab: Fall 2001 – Spring 2005
- \* EE 494 Power System Lab: Spring 2004 & Spring 2005

## INDUSTRY EXPERIENCE

### Appointments

September 2001 – May 2005

#### Electrical Engineer

General Electric Company of Libya (GECOL), Benghazi, Libya

Engineer at the operating center of Benghazi Steam and Gas power plants

Electrical maintenance engineer

Leader of several field works including:

- Transformer testing and replacement
- Gas turbine maintenance
- Generator maintenance
- Earthing resistance for lighting arresters

A committee chair for interviewing and hiring engineers at the GECOL

January 1999 – September 2001

#### Electrical Engineer

General Electric Company of Libya (GECOL), Elkoufra, Libya

Engineer at the operating center of Elkoufra Gas power plant

Electrical maintenance engineer

Leader of several field works including: • Generator protection settings

- Protection wirings and CT replacement
- Gas turbine maintenance.

### Technical Projects

- Gas Turbine inspection and maintenance: five times, twice at Elkoufra Power Plant–Libya, FIAT type and three times at Benghazi Power Plant–Libya, ABB-Alstom GT13E1.
- Commissioning of ABB-Alstom GT13E1 Gas Turbine at North Benghazi Power Plant.
- Commissioning of DAEWOO two combined cycle units with capacity of 150 MW each at North Benghazi Power Plant.

## PROFESSIONAL AND COMMUNITY SERVICE

### Review

- IEEE Transactions on Power Systems
- IEEE Transactions on Sustainable Energy
- IEEE Transactions on Smart Grid
- IEEE Transactions on Industry Applications
- IEEE Transactions on Power Electronic
- IEEE Transactions on Industrial Electronic
- Journal of Applied Sciences
- Journal of Sustainability
- Journal of Renewable Energy
- SpringerPlus Journal
- IET Journals: Generation Transmission and Distribution; Renewable Power Generation
- International Journal of Electrical Power and Energy Systems
- Journal of Multi-Criteria Decision Analysis
- IEEE Power Engineering Society Conferences (General Meetings & Transmission and

Distribution Conference and Exposition)

- IEEE Industry Applications Society Annual Meeting
- International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)
- North American Power Symposium
- Book chapters

### Short Courses Taught

4. Transformer Earthing and Protection, Benghazi–Libya, 2006, 18 hours of teaching. Conducted by University of Benghazi and targeted to Engineers of General Electric Company of Libya
3. Circuit Breakers – Review and Selection, Benghazi–Libya, 2006, 18 hours of teaching. Conducted by University of Benghazi and targeted to Engineers of General Electric Company of Libya
2. Blackout Restoration, Benghazi Libya, 2007, 24 hours of teaching. Conducted by University of Benghazi and targeted to Engineers of General Electric Company of Libya
1. Transient Stability Analysis of Faults at Generator Terminals, Benghazi Libya, 2007, 24 hours of teaching. Conducted by University of Benghazi and targeted to Engineers of General Electric Company of Libya

### Invited Talks

1. Mohammed Benidris, “Renewable Energy Generation Modeling, Challenges, and Promises,” IEEE MTTs/IPS Chapter of Northern Nevada, October, 2016.

### University Service

[University of Nevada, Reno](#), Reno, NV, USA

- Chair, College of Engineering Research Committee; May 2019 – present
- Member, Education Differential Fee Allocation Committee; August 2019 – present
- Member, Cyberinfrastructure Committee (CiC), University of Nevada, Reno; January 2018 – present
- Advising graduate and undergraduate students, (August 2016 – present)

[University of Benghazi](#), Benghazi, Libya

- Chair, Engineering Departments of Elmaraj Branch, (January 2007 – August 2008). This branch consists of Electrical, Mechanical, Industrial, Civil and Chemical Engineering. I was a chair in several committees for hiring new faculties, developing curriculum and building labs.
- Member, Faculty Search Committee, EE Department, 2006 – 2008.
- Chair, Labs Training Program, Branches of Elmaraj and Ajdabia Engineering Departments, 2005 – 2008.
- Chair, Practical Training Program, Branches of Elmaraj and Ajdabia Engineering Departments, 2005 – 2008.
- Member, M.Sc. Qualifying Examination Committee, EE Department 2007.
- Member, Renovating Laboratory Equipment Committee, EE Department, 2006 – 2007.

**Professional Service**

- Chair, IEEE Northern Nevada Section; January 2019 – present
- Members development, IEEE Northern Nevada Section; January 2017 – December 2018
- Vice Chair, IEEE Northern Nevada Section; August 2016 – December 2017
- Chair, IEEE Taskforce on Power System Resilience Metrics and Evaluation Methods
- Advisor, IEEE Industry Application Society, Students Chapter, University of Nevada, Reno; October 2018 – present
- Local committee chair, Electrical Safety Workshop (ESW), Reno, Nevada — IEEE Industry Applications Society, 2023
- Local committee chair, Electrical Safety Workshop (ESW), Reno, Nevada — IEEE Industry Applications Society, 2020
- Local committee member, Electrical Safety Workshop (ESW), Reno, Nevada — IEEE Industry Applications Society, 2017
- Panel Chair, IEEE Power & Energy Society General Meeting, Atlanta, GA, USA, 2019
- Session Chair, North American Power Symposium, Denver, CO, USA, 2016; Morgantown, WV, USA, 2017; Fargo, ND, USA, 2018; and Wichita, KS, 2019,
- Session Chair, IEEE Power & Energy Society General Meeting, Portland, OR, USA, 2018; and Atlanta, GA, USA, 2019
- Session Chair, International Conference on Probabilistic Methods Applied to Power Systems (PMAPS), Boise, ID, USA, 2018
- Co-organized the 2017 Northwest Public Power Association Engineering & Operations Conference and Trade Show in Reno

**PROFESSIONAL SOCIETY & COMMITTEE MEMBERSHIP**

- Member, [Institute of Electrical and Electronics Engineers \(IEEE\)](#)
- Member, [IEEE Power and Energy Society](#)
- Member, [IEEE Education Society](#)
- Member, [IEEE Industry Applications Society](#)
- IEEE Power System Analysis, Computing, and Economics Committee
  - Reliability, Risk and Probability Applications subcommittee (RRPA)
    - Chair, RRPA TF on Resilience Metrics and Evaluation Methods for Power Systems
    - Member, RRPA TF on Reliability Considerations in Emerging Cyber-Physical Electrical Energy Systems
    - Member, RRPA TF on Reliability Impact of Demand Side Resources
    - Member, RRPA WG on LOLE Best Practices Planning
    - Member, RRPA WG on Probability Application for Common Mode Events in Electric Power Systems (PACME)
  - Intelligent Systems Subcommittee (ISS)

- Member, ISS WG on Intelligent Control Systems
- Member, ISS TF on Micro-Grid Control Systems
- IEEE Power Systems Operations Committee
  - Member, TF on Real-Time Contingency Analysis
- IEEE Transmission and Distribution Committee
  - Member, WG on Distribution Reliability
  - Member, WG on Wind and Solar Power Plants System Impacts and Interconnection Requirements
  - Member, TF on Wind Farm Collector System Grounding for Personal Safety
- IEEE Wind and Solar Coordinating Committee
  - Member, TF on Capacity Value of Solar Power

## AWARDS

- Most helpful professor, IEEE chapter, University of Nevada, Reno, Spring 2019
- Most supportive professor, IEEE chapter, University of Nevada, Reno, Spring 2019
- Most helpful professor, IEEE chapter, University of Nevada, Reno, Spring 2018
- Most supportive professor, IEEE chapter, University of Nevada, Reno, Spring 2018
- 2018 Outstanding Section Membership Recruitment and Retention Performance, 2018
- 2017 Outstanding Section Membership Recruitment and Retention Performance, 2017
- Most involved professor, IEEE chapter, University of Nevada, Reno, Spring 2017
- Grad Assistantship, Michigan State University, teaching ECE 345, Fall 2014
- Scholarship for High Performance Computers and Parallel Computation at University of Iowa Summer School, Summer 2013
- Outstanding Research Performance, Michigan State University, Spring 2012.

## TRAINING

- **Teaching:**
  - An Introduction to Evidence-Based Undergraduate STEM Teaching (*passed with distinction*).
  - Creating an interactive classroom environment
  - The use of technology in teaching
  - Establishing Powerful Learning Outcomes
  - Aligning Assessments With Course Outcomes
  - Aligning Activities and Assignments With Course Outcomes
  - Developing Fair, Consistent, and Transparent Grading Practices
  - Preparing an Effective Syllabus
  - Effective Teaching Practices
    - \* Leading the First Day of Class
    - \* Motivating Your Students
    - \* Connecting With Your Students



- \* Helping Students Persist in Their Studies
- \* Planning an Effective Class Session
- \* Checking for Student Understanding
- \* Delivering an Effective Lecture
- \* Teaching Powerful Note-Taking Skills
- \* Developing and Using Rubrics and Checklists
- \* Providing Useful Feedback
- \* Using Concept Maps and Other Visualization Tools
- \* Engaging Underprepared Students
- \* Planning Effective Class Discussions
- \* Facilitating Engaging Class Discussions
- \* Using Active Learning Techniques in Small Groups
- \* Using Active Learning Techniques in Large Classes
- \* Using Advanced Questioning Techniques
- \* Developing Self-Directed Learners
- \* Using Student Achievement and Feedback to Improve Your Teaching
- \* Embracing Diversity in Your Classroom
- \* Promoting a Civil Learning Environment

- **Research Ethics:**

- Conflict of Interest, Peer Review, and Collaboration/Teamwork
- Scientific Communications, Rights to Data, and Authorship
- Crediting the Works of Others and Avoiding Plagiarism
- Misconduct in Research and Creative Activities
- Protecting Human Research Participants
- Responsible Mentoring
- The Care and Use of Animals in Research

- **Professional Development:**

- Writing Science: How to Write Papers that Get Cited and Proposals that Get Funded
- Being an Early Career Scholar
- Write Winning Grant Proposals
- New Principal Investigator Workshop
- Mastering Academic Time Management
- STEM (NIH/NSF) Proposal Writing Workshop

- **Technology:**

- High Performance Computers and Parallel Computation, iCER Michigan State University.
- High Performance Computers and Parallel Computation, University of Iowa summer school.
- The use of MPI and OpenMP, iCER Michigan State University.
- The use of CUDA in parallel computation, iCER Michigan State University.

## PUBLICATIONS

### Ph.D. Dissertation:

“Applications of Sensitivity Analysis in Planning and Operation of Modern Power Systems.” Adviser: Prof. Joydeep Mitra, published by ProQuest, UMI Dissertations Publishing, 2014.

### Book Chapters:

3. J. Mitra, M. Benidris and N. Nguyen, “Dynamic Contingency Analysis and Remedial Action Tools for Secure Electric Cyber-Physical Systems,” in *Cyber-Physical-Social Systems and Constructs in Electric Power Engineering*. Editors: Siddharth Suryanarayanan, Robin Roche and Timothy Hansen, IET.
2. S. Elsaiah, M. Benidris and J. Mitra, “Reliability-Constrained Optimal Distribution System Reconfiguration,” in *Computational Intelligence Applications in Modeling and Control, Studies Comp. Intelligence*, Vol. 575, (Editors: Ahmad Taher Azar and Sundarapandian Vaidyanathan), Springer.
1. M. Benidris, S. Elsaiah and J. Mitra, “Applications of the Particle Swarm Optimization in Composite Power System Reliability Evaluation,” *Handbook of Research on Swarm Intelligence in Engineering*, Eds. S. Bhattacharyya and P. Dutta, IGI Global, Hershey, PA, USA, 2015.

### Patents:

1. J. Mitra, M. Benidris, and N. Cai, ”Tool Employing Homotopy-Based Approaches in Finding the Controlling Unstable Equilibrium Point in the Electric Power Grid,” US Patent 10,097,000, October 9, 2018. [Online].  
Available: <https://patents.google.com/patent/US20160041232A1/en>

### Journal Publications:

15. N. Bhusal, M. Abdelmalak, M. Kamruzzaman and M. Benidris, “Power System Resilience: Current Practices, Challenges, and Future Directions,” in *IEEE Access*, vol. 8, pp. 18064–18086, 2020.
14. J. Mitra, X. Xu and M. Benidris, “Reduction of Three-Phase Transformer Inrush Currents Using Controlled Switching,” *IEEE Transactions on Industry Applications*, Early Access, 2019.
13. J. Mitra and M. Benidris, “A Homotopy-based Method for Robust Computation of Controlling Unstable Equilibrium Points,” *IEEE Transactions on Power Systems*, Early Access, 2019.
12. M. Kamruzzaman and M. Benidris, “Reliability-Based Metrics to Quantify the Maximum Permissible Load Demand of Electric Vehicles,” *IEEE Transactions on Industry Applications*, vol. 55, no. 4, pp. 3365–3375, July–Aug. 2019.
11. T. Yuting, A. Bera, M. Benidris, and J. Mitra, “Stacked Revenue and Technical Benefits of a Grid-connected Energy Storage System,” *IEEE Transactions on Industry Applica-*

- tions, vol. 54, no. 4, pp. 3034–3043, April 2018.
10. M. Benidris, J. Mitra, and C. Singh, “Integrated Evaluation of Reliability and Stability of Power Systems,” *IEEE Transactions on Power Systems*, vol. 32, no. 5, pp. 4131–4139, Jan. 2017.
  9. J. Mitra, M. Benidris, N. Nguyen, and S. Deb, “A Visualization Tool for Real-Time Dynamic Contingency Screening and Remedial Actions,” *IEEE Transactions on Industry Applications*, vol. 53, no. 4, pp. 3268–3278, March 2017.
  8. S. Sulaeman, T. Yuting, M. Benidris, and J. Mitra, “Quantification of Storage Necessary to Firm Up Wind Generation,” *IEEE Transactions on Industry Applications*, vol. 53, no. 4, pp. 3228–3236, March 2017.
  7. S. Sulaeman, M. Benidris, and J. Mitra, “A Wind Farm Reliability Model Considering Both Wind Variability and Turbine Forced Outages,” *IEEE Transactions on Sustainable Energy*, vol. 8, no. 2, pp. 629–637, Sept. 2017.
  6. M. Benidris, S. Elsaiah and J. Mitra, “An Emission-Constrained Approach to Power System Expansion Planning,” *International Journal of Electrical Power & Energy Systems*, vol. 81, Pages 78–86, Oct. 2016.
  5. M. Benidris and J. Mitra, “Reliability and Sensitivity Analysis of Composite Power Systems under Emission Constraints,” *IEEE Transactions on Power Systems*, vol. 29, no. 1, pp. 402–4012, Jan. 2014.
  4. S. Elsaiah, M. Benidris and Joydeep Mitra, “Analytical approach for placement and sizing of distributed generation on power distribution system,” *IET Generation, Transmission and Distribution*, vol. 8, no. 6, pp. 1039–1049, 2014.
  3. S. Elsaiah, N. Cai, M. Benidris and J. Mitra, “Fast Economic Power Dispatch Method for Power System Planning Studies,” *IET Generation, Transmission and Distribution*, vol. 9, no. 5, pp. 417–426, 2015.
  2. M. Benidris and J. Mitra, “Reliability and Sensitivity Analysis of Composite Power Systems Considering Voltage and Reactive Power Constraints,” *IET Generation, Transmission and Distribution*, vol. 9, no. 12, pp. 1245–1253, 2015.
  1. M. Benidris, S. Elsaiah and J. Mitra, “Power System Reliability Evaluation using a State Space Classification Technique and Particle Swarm Optimization Search Method,” *IET Generation, Transmission and Distribution*, vol. 9, no. 14, pp. 1865–1873, 2015.

**Peer-Reviewed Conference Proceedings:**

64. N. Bhusal, M. Gautam, and M. Benidri, “Sizing of Movable Energy Resources for Service Restoration and Reliability Enhancement,” *IEEE PES General Meeting, Montreal, Quebec, Canada, 2020*, pp. 1–5.
63. M. Abdelmalak, M. Kamruzzaman, and M. Benidris, “Probabilistic Sizing of Virtual Energy Storage Devices for Transient Stability Enhancement,” *IEEE PES General Meeting, Montreal, Quebec, Canada, 2020*, pp. 1–5.
62. S. Elsaiah, M. Benidris, and J. Mitra, “Sensitivity Analysis of Power System Reliability Indices Including Voltage and Reactive Power Constraints,” *IEEE PES General Meeting, Montreal, Quebec, Canada, 2020*, pp. 1–5.

61. M. Abdelmalak, M. Benidris, and L. Hanif, "A Polynomial Chaos-based Approach to Quantify Uncertainty of Solar Energy in Electric Power Distribution Systems," IEEE Transmission & Distribution (T&D), Chicago, IL, USA, April 2020, pp. 1–5.
60. M. Gautam, N. Bhusal, and M. Benidris, "A Sensitivity-based Approach to Adaptive Under-Frequency Load Shedding," IEEE Texas Power and Energy Conference, College Station, TX, USA, February 2020, pp. 1–6.
59. N. Bhusal, M. Abdelmalak, and M. Benidris, "Optimum Locations of Utility-Scale Shared Energy Storage Systems," 8th International Conference on Power Systems, Jaipur, India, December 2019, pp. 1–5.
58. M. Kamruzzaman and M. Benidris, "A Smart Charging Strategy for Electric Vehicles to Increase their Hosting Capacity in Distribution Systems," 51st North American Power Symposium, Wichita, KS, USA, 2019, pp. 1–5.
57. M. Kamruzzaman and M. Benidris, "Maximum Permissible Load Demand for Electric Vehicles at Power System Buses," IEEE Power & Energy Society General Meeting, Atlanta, GA, USA, 2019, pp. 1–5.
56. M. Kamruzzaman, N. Bhusal and M. Benidris, "Determining Maximum Hosting Capacity of Electric Distribution Systems to Electric Vehicles," IEEE Industry Applications Society Annual Meeting, Baltimore, MD, USA, 2019, pp. 1-7.
55. N. Bhusal, M. Kamruzzaman and M. Benidris, "Photovoltaic Hosting Capacity Estimation Considering the Impact of Electric Vehicles," IEEE Industry Applications Society Annual Meeting, Baltimore, MD, USA, 2019, pp. 1-6.
54. M. Kamruzzaman and M. Benidris, "Effective Accessible Energy to Accommodate Load Demand of Electric Vehicles," IEEE Industry Applications Society Annual Meeting, Portland, OR, USA, 2018, pp. 1–8.
53. J. Mitra, X. Xu, and M. Benidris, "A Controlled Switching Approach to Reduction of Three-Phase Transformer Inrush Currents," IEEE Industry Applications Society Annual Meeting, Portland, OR, USA, 2018, pp. 1–7.
52. S. Elsaiah, M. Benidris, Y. Tian, and J. Mitra, "A Comprehensive Analysis of Reliability-oriented Distribution System Reconfiguration," IEEE Industry Applications Society Annual Meeting, Portland, OR, USA, 2018, pp. 1–8.
51. M. Kamruzzaman, M. Benidris, and H. Xu, "A Modified Direct Torque Control for Permanent Magnet Synchronous Machines (PMSMs)," IEEE Power & Energy Society General Meeting, Portland, OR, USA, 2018, pp. 1–5.
50. M. Kamruzzaman, M. Benidris, and H. Xu, "Modeling of Electric Vehicles as Movable Loads in Composite System Reliability Assessment," IEEE Power & Energy Society General Meeting, Portland, OR, USA, 2018, pp. 1–6.
49. M. Kamruzzaman, M. Benidris, and S. Cummuri, "An Artificial Neural Network based Approach to Electric Demand Response Implementation," North American Power Symposium, Fargo, ND, USA, 2018, pp. 1–5.
48. M. Kamruzzaman, M. Benidris, and H. Livani, "A Cost Effective Energy Exchange Strategy to Improve Reliability of Microgrids," North American Power Symposium, Fargo, ND, USA, 2018, pp. 1–5.

47. M. Kamruzzarnan and M. Benidris, "Demand Response based Power System Reliability Enhancement," 2018 IEEE International Conference on Probabilistic Methods Applied to Power Systems (PMAPS), Boise, ID, 2018, pp. 1–6.
46. M. Kamruzzaman, M. Benidris and S. Elsaiah, "Effective Load Demand of Electric Vehicles in Power System Adequacy Assessment," 2018 IEEE International Conference on Probabilistic Methods Applied to Power Systems (PMAPS), Boise, ID, 2018, pp. 1–5.
45. Y. Tian, A. Bera, J. Mitra, C. Murray and M. Benidris, "A Two-stage Planning Strategy for Reliability Enhancement and Loss Reduction in Distribution Systems," 2018 IEEE International Conference on Probabilistic Methods Applied to Power Systems (PMAPS), Boise, ID, 2018, pp. 1–6.
44. V. Aravinthan et al., "Reliability Modeling Considerations for Emerging Cyber-Physical Power Systems," 2018 IEEE International Conference on Probabilistic Methods Applied to Power Systems (PMAPS), Boise, ID, 2018, pp. 1–7.
43. S. Sulaeman, F. Alharbi, M. Benidris, and J. Mitra, "A New Method to Evaluate the Optimal Penetration Level of Wind Power," IEEE PES North American Power Symposium (NAPS), Morgantown, WV, 2017, pp. 1–5.
42. S. Sulaeman, M. Benidris, and J. Mitra, "Capacity Value of Photovoltaic Systems and their Impacts on Power System Reliability," IEEE PES North American Power Symposium (NAPS), Morgantown, WV, 2017, pp. 1–5.
41. Y. Tian, A. Bera, M. Benidris, and J. Mitra, "Reliability and Environmental Benefits of Energy Storage Systems in Firming up Wind Generation," IEEE PES North American Power Symposium (NAPS), Morgantown, WV, 2017, pp. 1–5.
40. S. Aznavi, P. Fajri, M. Benidris, and B. Falahati, "Hierarchical Droop Controlled Frequency Optimization and Energy Management of a Grid-Connected Microgrid," The 5th Annual IEEE Conference on Technologies for Sustainability, Phoenix, Arizona, 2017, pp. 1–7.
39. Y. Tian, A. Bera, M. Benidris, and J. Mitra, "Economic and Technical Benefits of a Storage System," IEEE Industry Applications Society Annual Meeting, Cincinnati, OH, 2017, pp. 1–8.
38. Y. Tian, N. Cai, M. Benidris, A. Bera, J. Mitra, and C. Singh, "Sensitivity Guided Genetic Algorithm for Placement of Distributed Energy Resources," Intelligent Systems Application to Power Systems, San Antonio, Texas, 2017, pp. 1–5.
37. M. Benidris, J. Mitra, and C. Singh, "Impacts of Transient Instability on Power System Reliability," International Conference on Probabilistic Methods Applied to Power Systems, Beijing, China, October, 2016, pp. 1–6.
36. N. Nguyen, M. Benidris and J. Mitra, "A Unified Analysis of the Impacts of Stochasticity and Low Inertia of Wind Generation," International Conference on Probabilistic Methods Applied to Power Systems, Beijing, China, October, 2016.
35. Y. Tian, M. Benidris, S. Sulaeman, S. Elsaiah, and J. Mitra, "Optimal Feeder Reconfiguration and Distributed Generation Placement for Reliability Improvement," International Conference on Probabilistic Methods Applied to Power Systems, Beijing, China, October, 2016.

34. J. Mitra, M. Benidris, and S. Deb, "A Visualization Tool for Real-Time Dynamic Contingency Screening and Remedial Actions," IEEE Industry Applications Society Annual Meeting, Portland, OR, October, 2016.
33. S. Sulaeman, Y. Tian, M. Benidris, and J. Mitra, "Quantification of Storage Necessary to Firm Up Wind Generation," IEEE Industry Applications Society Annual Meeting, Portland, OR, October, 2016.
32. M. Benidris, Y. Tian, S. Sulaeman, and J. Mitra, "Optimal Location and Size of Distributed Energy Resources Using Sensitivity Analysis-Based Approaches," North American Power Symposium, Denver, Colorado, September, 2016.
31. S. Sulaeman, M. Benidris, S. Elsaiah, Y. Tian, and J. Mitra "Power System Reliability Enhancement and Generation Cost Reduction in Presence of Variable Resources," IEEE PES General Meeting, Boston, MA, July 2016.
30. S. Sulaeman, M. Benidris, Y. Tian and J. Mitra, "Modeling and assessment of PV solar plants for composite system reliability considering radiation variability and component availability," 19th Power Systems Computation Conference, Genoa, Italy, June 2016.
29. S. Elsaiah, M. Benidris and J. Mitra, "A Method for Reliability Improvement of Microgrids," 19th Power Systems Computation Conference, Genoa, Italy, June 2016.
28. J. Mitra, M. Benidris and N. Cai, "Use of Homotopy-based Approaches in Finding Controlling Unstable Equilibrium Points in Transient Stability Analysis," 19th Power Systems Computation Conference, Genoa, Italy, June 2016.
27. M. Benidris, S. Sulaeman, Y. Tian and J. Mitra, "Reactive Power Compensation for Reliability Improvement of Power Systems," IEEE PES T&D Conference and Exposition, Dallas, May 2016.
26. S. Sulaeman, M. Benidris, Y. Tian and J. Mitra, "Modeling and Evaluating the Capacity Credit of PV Solar Systems Using An Analytical Method," IEEE PES T&D Conference and Exposition, Dallas, May 2016.
25. S. Sulaeman, M. Benidris and J. Mitra, "Modeling the Output Power of PV Farms for Power System Adequacy Assessment," North American Power Symposium, North Carolina, Charlotte, October 2015.
24. S. Sulaeman, M. Benidris and J. Mitra, "Evaluation of Wind Power Capacity Value Including Effects of Transmission System," North American Power Symposium, North Carolina, Charlotte, October 2015.
23. S. Sulaeman, M. Benidris and J. Mitra, "A method to model the output power of wind farms in composite system reliability assessment," Proceedings of the North American Power Symposium, Pullman, Washington, September, 2014.
22. M. Benidris and J. Mitra, "Consideration of the Effects of Voltage and Reactive Power Constraints on Composite System Reliability," Proceedings of the North American Power Symposium, Pullman, Washington, September, 2014.
21. M. Benidris, S. Elsaiah and J. Mitra, "A Risk Sensitivity-Based Approach to Hardening Power Systems against Catastrophic Failures," Proceedings of the North American Power Symposium, Pullman, Washington, September, 2014.
20. M. Benidris, N. Cai and J. Mitra, "A Fast Transient Stability Screening and Ranking

- Tool,” Proceedings of the Power Systems Computation Conference, PSCC, August 2014.
19. S. Sulaeman, M. Benidris, S. Tanneeru and J. Mitra, “Evaluation of Wind Capacity Credit Using Discrete Convolution Considering the Mechanical Failure of Wind Turbines,” Proceedings of the 13th International Conference on Probabilistic Methods Applied on Power Systems, PMAPS, Durham, UK, July 2014.
  18. S. Elsaiah, M. Benidris and J. Mitra, “Reliability improvement of power distribution system through feeder reconfiguration,” Proceedings of the 13th International Conference on Probabilistic Methods Applied on Power Systems, Durham, UK, July 2014.
  17. M. Benidris and J. Mitra, “Sensitivity Analysis of Power System Reliability Indices under Emission Constraints,” Proceedings of the 13th International Conference on Probabilistic Methods Applied on Power Systems, PMAPS, Durham, UK, July 2014.
  16. S. Sulaeman, S. Tanneeru, M. Benidris and J. Mitra, “An Analytical Method for Constructing a Probabilistic Model of a Wind Farm,” Proceedings of the IEEE Power and Energy Society General Meeting, Washington DC, July, 2014.
  15. S. Elsaiah, M. Benidris and J. Mitra, “Optimal economic power dispatch in the presence of intermittent renewable energy sources,” Proceedings of the IEEE Power and Energy Society General Meeting, Washington DC, July, 2014.
  14. M. Benidris and J. Mitra, “Use of Intelligent Search Methods in Performing Sensitivity Analysis of Power System Reliability Indices,” Proceedings of the IEEE Power and Energy Society General Meeting, Washington DC, July, 2014. (Best Conference Papers on Power System Analysis and Modeling)
  13. S. Elsaiah, M. Benidris and J. Mitra, “An Analytical Method for Placement and Sizing of Distributed Generation on Distribution Systems,” Proceedings of the Power Systems Conference, Clemson University, March 2014.
  12. M. Benidris, S. Elsaiah, J. Mitra, “Composite power system reliability assessment using maximum capacity flow and directed Binary Particle Swarm Optimization,” Proceedings of the North American Power Symposium, Sept. 2013.
  11. M. Benidris, J. Mitra, “Composite system reliability assessment using dynamically directed Particle Swarm Optimization,” Proceedings of the North American Power Symposium, Sept. 2013.
  10. M. Benidris, S. Elsaiah, S. Sulaeman and J. Mitra, “Transient Stability of Distributed Generators in the Presence of Energy Storage Devices,” Proceedings of the North American Power Symposium, NAPS, September 2012.
  9. M. Benidris, S. Elsaiah and J. Mitra, “Sensitivity Analysis of Reliability Performance of Multi-Level Converters,” Proceedings of the North American Power Symposium, September NAPS 2012.
  8. S. Elsaiah, M. Benidris and J. Mitra, “Power Flow Analysis of Distribution Systems with Embedded Induction Generators,” Proceedings of the North American Power Symposium, NAPS, September 2012.
  7. S. Elsaiah, M. Benidris and J. Mitra, “Power Flow Analysis of Radial and Weakly Meshed Distribution Networks,” Proc. of the IEEE Power & Energy Society General Meeting, San Diego, CA, July 2012.

6. M. Benidris and J. Mitra, "Enhancing Stability Performance of Renewable Energy Generators by Utilizing Virtual Inertia," Proceedings of the IEEE Power and Energy Society General Meeting, San Diego, CA, July, 2012.
5. M. Benidris, J. Mitra and S. Elsaiah, "A Method for Reliability Evaluation of Multi-Level Converters," Proceedings of the 12th International Conference on Probabilistic Methods Applied on Power Systems, PMAPS, Istanbul, Turkey, June 2012.
4. S. Elsaiah, M. Benidris and J. Mitra, "A three-phase power flow solution method for unbalanced distribution networks," Proceedings of the North American Power Symposium, NAPS, September 2011.
3. M. Benidris, S. Elsaiah and J. Mitra, "Sensitivity Analysis in Composite System Reliability Using Weighted Shadow Prices," Proceedings of the IEEE Power and Energy Society General Meeting, Detroit, MI, July, 2011.
2. S. Elsaiah, M. Benidris, A. Hamuda and M. ElMhabresh, M. Abunjeem, "Performance Analysis of a Three-Phase Self-Excited Induction Generator," Proceedings of the 2nd International Conference on Electrical and Electronics Engineering, Laghuat, Algeria, April 2008.
1. M. Benidris, A. Al-Jalil and A. Elfaituri, "Performance Analysis of High Voltage Direct Current Transmission Lines—Libya to Sudan DC Link Case Study," Proceedings of the 4th Libyan Arab International Conference on Electrical and Electronics Engineering, March 2006.

#### **Abstract Conference Proceedings:**

3. M. Benidris, J. Mitra, and C. Singh, "Integrated Evaluation of Reliability and Stability of Power Systems," IEEE Power and Energy Society General Meeting, Portland, OR, USA, 2018.
2. S. Sulaeman, M. Benidris, J. Mitra, and C. Singh, "A Wind Farm Reliability Model Considering Both Wind Variability and Turbine Forced Outages," IEEE Power and Energy Society General Meeting, Chicago, IL, 2017.
1. M. Benidris and J. Mitra, "Power System Reliability and Sensitivity Analysis under the Emission Constraints," IEEE Power and Energy Society General Meeting, Washington DC, July, 2014.

## **PRESENTATIONS**

#### **Panel Presentations:**

5. Mohammed Benidris, "NSF CAREER Award Navigation," IEEE Power and Energy Society General Meeting, Montreal, Canada, 2020.
4. Mohammed Benidris, "Resilience Evaluation of Future Power Grids," IEEE Power and Energy Society General Meeting, Atlanta, GA, USA, 2019.
3. Mohammed Benidris, "A Real-Time Remedial Action Scheme to Harden Cyber-Physical Energy Systems against Catastrophic Failures," IEEE Power and Energy Society General Meeting, Chicago, IL, 2017.
2. Joydeep Mitra and Mohammed Benidris, "Homotopy-based Method for Rapid Screening



of Dynamic Contingencies,” IEEE Power and Energy Society General Meeting, Boston, MA, July, 2016.

1. Joydeep Mitra and Mohammed Benidris, “Real-Time Remedial Action Screening Using Direct Stability Analysis Methods,” IEEE Power and Energy Society General Meeting, Washington DC, July, 2014.

#### **Invited Talks**

1. Mohammed Benidris, “Renewable Energy Generation Modeling, Challenges, and Promises,” IEEE MTTs/IPS Chapter of Northern Nevada, October, 2016.

#### **Conference Poster Presentations:**

14. M. Benidris and J. Mitra, “An On-Line Transient Stability Screening Tool Utilizing Homotopy and Newton Methods in Finding the Controlling Unstable Equilibrium Points,” IEEE PES T&D Conference and Exposition, Chicago, IL , April, 2014.
13. M. Benidris and J. Mitra, “A Lyapunov Function Based Remedial Action Screening Tool Using Real-Time Data,” IEEE Power and Energy Society General Meeting, Washington DC, July, 2014
12. M. Benidris, S. Elsaiah and J. Mitra, “Utilization of energy storage devices as virtual inertia,” IEEE South Eastern Michigan, SEM Fall conference at university of Michigan-Dearborn 2012.
11. M. Benidris and J. Mitra, “Mitigation of Cascading Failures in power systems,” IEEE South Eastern Michigan, SEM Spring conference at university of Michigan-Dearborn 2013.
10. M. Benidris and J. Mitra, “Composite Power System Reliability Assessment Using Maximum Capacity Flow and PSO,” IEEE South Eastern Michigan, SEM, Fall conference at university of Michigan-Dearborn 2013.
9. M. Benidris and J. Mitra, “An On-line transient Stability Screening Tool Utilizing Homotopy and Newton Methods in Finding the Controlling Unstable Equilibrium Points,” IEEE South Eastern Michigan, SEM, Spring conference at university of Michigan-Dearborn 2014.
8. M. Benidris, S. Elsaiah and J. Mitra, “Shadow Price Sensitivity analysis in composite systems,” MSU, College of Engineering Symposium 2011.
7. M. Benidris, S. Elsaiah and J. Mitra, “Multi-Level Inverter Reliability,” MSU, Graduate School Conference, March 2012.
6. S. Elsaiah, M. Benidris and J. Mitra, “Distribution Systems Load Flow Analysis with Weakly Meshed Networks,” MSU, Graduate School Conference, March 2012.
5. M. Benidris and J. Mitra, “Effect of emission constraints on power system reliability,” MSU, HPCC cyber days 2012.
4. M. Benidris and J. Mitra, “Cascading Failures in Power Systems,” MSU, College of Engineering Symposium, 2013.
3. M. Benidris and J. Mitra, “An On-line transient Stability Screening and Ranking Tool based on Lyapunov functions,” MSU, HPCC cyber days 2013.
2. M. Benidris and J. Mitra, “A fast Transient Stability Screening Tool,” MSU, College of

Engineering Symposium, 2013.

1. M. Benidris and J. Mitra, "Directed PSO application in power system reliability analysis," MSU, Graduate School Conference, March 2014.