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**Duke Energy Distinguished Professor**

Director, Power, Energy and Intelligent Systems Laboratory

Lead, and Technical Director for the DoE Project, <https://redispv.org>

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Google Scholar: <https://scholar.google.com/citations?user=4TGyvY8AAAAJ&hl=en>

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### **I Professional Profile**

#### ▪ **Research**

- High impact research projects resulted in student research, workforce development, research tools, patented tools installed at various utilities and used by the industry
- Published 209 peer-reviewed research articles (59 Journals and 150 conference papers), 4 book chapters, 1 book, and 4 patents.
- Serving/Served as PI, Co-PI for research funding/grants of more than \$12.6 M total (individual contributions \$7.2M) supported by the National Science Foundation (NSF), Department of Energy (DOE), Duke Energy, Siemens Energy, Southern California Edison, National Renewable Energy Lab, and other industries.
- Direct supervision of 59 graduate Thesis/Dissertation/project (31 Ph.D.+ 28 M.S.) with existing research group of 18 members (15 Ph.D. + 1 M.S. + 1 post-docs + 1 collaborating faculty).
- Other supervision (Exchange Scholars/Committee membership/ External evaluation)- 45 students.
- Undergraduate research-level supervision – 11 students.
- 30+ Keynotes/ tutorials/invited talks in 10 countries and additional 100+ invited talks and panels at multiple conferences.
- UNC Charlotte Faculty Research Excellence Award, 2021.
- NSF CAREER Award, 2008.

#### ▪ **Teaching**

- Taught more than 60- 3 credit hour courses related to the smart power grid and IBR Integrated Power Grid with excellent student feedback
- mentored more than 78 undergraduate students in 19 Senior design teams all with industry projects and have several national-level awards for these students in IEEE conferences.
- Invited Workshop, U.S.-India State & Urban Initiative at CSIS, Washington, D.C., 2017.
- Faculty workshop on “Reforming electric energy systems curriculum with an emphasis on sustainability, Washington, DC, 2015.
- Faculty Mentoring Program, The Advance Faculty Affairs office, UNC Charlotte.
- Introduced or restructured courses in Smart Grid, Power System Stability, Power Generation Operation and Control, Electromagnetic Devices, Control System, and Electric Power System to include IBR integrated power grid challenges and solutions.
- Co-PI, National Science Foundation, IUSE award on curriculum innovation, 2021.
- Taught courses on grid modernization to Utility and industry cohorts, 2008.

#### ▪ **Service and Recognitions**

- IEEE IAS citation of appreciation for Outstanding Dedication and Effort as the chair of the Industrial Automation and Control Committee from 2019- 2021.

- IEEE IAS citation of appreciation for Outstanding Dedication and Effort as the technical committee paper review chair of the Industrial Automation and Control Committee from 2017-2021.
- Duke Energy distinguished professorship in power engineering, The University of North Carolina at Charlotte, April 2019 – Present.
- Three (3) First Prize paper awards from flagship conferences of IEEE PES and IEEE IAS.
- One (1) Second best paper award from IEEE conference.
- Three (3) best paper finalists from flagship conferences of IEEE PES and IEEE IAS (Top 10).
- One (1) nomination for the best paper award from IEEE Transactions on Industry Applications (Top 5).
- Twice (2) nominated for the Outstanding Teaching Award from the Department of ECE, UNC Charlotte.
- Outstanding teaching award from the University of Toledo, OH, College of Engineering.
- Paper Review Chair (Area Editor), IEEE Transactions on Industry Applications 2020-2021.
- Associate Editor, IEEE Transactions on (Industry Applications and Vehicular Technology), 2015, 2016- Present.
- General Chair, 2nd Electric Power and Renewable Energy Conference (EPREC-2022).
- General Co-Chair, North American Power Symposium (NAPS), 2015.
- Chair, IEEE Power and Energy Society (PES), PES University, Selection, and Quality Control Committee.
- Chair, IEEE PES Power and Energy Education Committee, (PEEC), 2022-2024
- Chair, of IEEE Industry Application Society, Industrial Automation and Control Committee (IACC), 2020-2021
- Technical Council member, IEEE IAS. 2020-2021, IEEE PES 2020-2021.
- Member, IEEE PES, Long Range Planning, Subcommittee, Governing Board, 2020-2021.
- Member, IEEE PES Taskforce on Energy Storage (T&D Committee), DER Interconnection (T&D Committee), Oscillation Location and Identification (PSDP Committee), Dynamic System Equivalence (PSDP Committee), Dynamic System State Estimation (AMPS Committee), Working Groups J 18, C38, C 43 and C 45 (PSRC Committee) and contributions to Technical Reports, Guide and related standards.
- **Other Leadership Activities**
  - Lead developing Duke Energy Smart Grid Lab (a \$5M facility) and directed lab activities (2012-2019).
  - Developed Power Energy and Intelligent Systems Laboratory (a \$1.5 M) facility (2010-Present).
  - Led departmental, college level and university level faculty governance and contributed towards university advancement.
  - Mentored more than 100 researchers all placed successfully at the national and international level.

## **II Education, Experience, Honors, and Recognition**

### **Education:**

- **Ph.D. in Electrical Engineering, The University of Toledo, Toledo, OH, USA, August 2004.**
  - Dissertation Advisor: Adel A. Ghandakly
  - Dissertation Title: A New Generation of Adaptive Control: An Intelligent Supervisory Loop Approach.
- **M.Eng. in Electrical Power Systems, Asian Institute of Technology, Thailand, August 1999.**
  - Thesis Advisor: D. Thukaram, Professor, IISc., Bangalore, India.
  - Thesis Title: A New Approach to Voltage Stability Assessment and Improvement.
- **B.Tech. in Electrical and Electronics Engineering, University of Calicut, India, July 1991.**
  - First Class with Distinction

### **Academic Experience:**

- **Research Coordinator**, Department of Electrical and Computer Engineering, The University of North Carolina at Charlotte (UNC Charlotte), Charlotte, North Carolina, **August 2021 – Present**
- **Duke Energy Distinguished Professor of Power Engineering**, Department of Electrical and Computer Engineering, The University of North Carolina at Charlotte (UNC Charlotte), Charlotte, North Carolina, **April 2019 – Present**
- **Full Professor (with Tenure)**, Department of Electrical and Computer Engineering, The University of North Carolina at Charlotte (UNC Charlotte), Charlotte, North Carolina, **August 2017 – Present**
- **Director, Power, Energy, and Intelligent Systems Laboratory**, Department of Electrical and Computer Engineering, The University of North Carolina at Charlotte (UNC Charlotte), Charlotte, North Carolina, **August 2010 – Present**
- **Associate Professor (with Tenure)**, Department of Electrical and Computer Engineering, The University of North Carolina at Charlotte (UNC Charlotte), Charlotte, North Carolina, **August 2010 – July 2017.**
- **Associate Professor (with Tenure)**, Department of Engineering and Computer Technology, The University of West Florida (UWF), Pensacola, Florida, **August 2009 – July 2010**
- **Assistant Professor**, Department of Engineering and Computer Technology, The University of West Florida (UWF), Pensacola, Florida, **August 2004 – July 2009**
- **Training and Consulting, Indyne**, Pensacola, Florida
  - Power System Courses, Summer 2008
- **Teaching Assistant/Research Assistant**, Department of Electrical Engineering and Computer Science, The University of Toledo, **August 2000 – July 2004**
  - Conducted research in intelligent control, developed algorithms, and introduced a new approach in intelligent adaptive control based on supervisory loop and system-centric controller, integrating fuzzy systems and neural networks. These basic ideas using supervisory loops have been implemented for controlling various power and energy system devices. The research work has attracted more than 500 citations, derivatives have been deployed in the field, and produced several awards, acclaims, and intellectual property/workforce.
- **Research Fellow**, Electrical Power Systems, Energy Program, Asian Institute of Technology, Thailand, **August 1999 – July 2000**
  - Conducted research in power systems analysis and design. Developed power flow algorithms, algorithms for short circuit studies, voltage stability, contingency screening methods, and algorithms for power system reliability measures and optimization techniques.
- **Research Scholar**, Electrical Power Systems, Energy Program, Asian Institute of Technology, Thailand, **January 1998 – July 1999**

- Developed new approaches in an online neural network-based voltage stability analysis and extended that to fuzzy logic-based voltage profile improvement. The work in machine learning approaches has provided new directions in data-drive control.

### **Industry Experience**

- **Training and Consulting, Gulf Power Companies, Pensacola, Florida**
  - Power System Courses, Summer 2006/ Summer 2007
- **Training and Consulting, Indyne, Pensacola, Florida**
  - Power System Courses, Summer 2008
- **Associate Manager/Electrical Engineer, June 1994– December 1997, Reliance Industries Limited, Mumbai India.**
  - Designed and developed captive power plant and power system distribution network for petrochemical complex and refinery that include technical analysis, fault calculation, vendor selection, and inspection.
- **Electrical Engineer, January 1993 – May 1994, Excel Industries Limited, Mumbai India.**
  - Designed and developed power distribution network including project design, performing energy conservation activities, control techniques, site inspection, and power management.
- **Project Engineer/Intern, January 1992 – December 1992, Tata Electric Companies, Mumbai India.**
  - Worked as a project site engineer for implementing a 500 MW combined cycle power plant.

### **Honors, Recognitions, and Awards (Last 10+ years): (Details are included here if not mentioned as the link below, <https://coefs.uncc.edu/skamalas>)**

- **IEEE IAS citation of appreciation** for Outstanding Dedication and Effort as the chair of the Industrial Automation and Control Committee from 2019- 2021.
- **IEEE IAS citation of appreciation** for Outstanding Dedication and Effort as the technical committee paper review chair of the Industrial Automation and Control Committee from 2017- 2021.
- **Duke Energy distinguished professorship in power engineering**, The University of North Carolina at Charlotte, April 2019 – Present.
- **Nominated for teaching excellence**, The University of North Carolina at Charlotte, 2015 and 2017.
- **Outstanding Teaching Assistant Award**, University of Toledo, OH, 2004.
- **Advisory board member**, National Renewable Energy Laboratory, 2020- Current.
- **Research accomplishment award**, Maximum number of Research Award Participation, UNC Charlotte, 2021. Recognition in 14 categories, <https://inside.charlotte.edu/news-features/2021-11-02/faculty-and-staff-recognized-research-accomplishments-illuminating-unc>
- **Best paper award**, IEEE PES GM, “Control of Transient Overvoltage for Inverter Only Based Microgrids in Power Distribution System”, Best Paper among 700 submissions, 2021.
- **Best paper finalist**, IEEE IAS AM, 2021 (from IACC), “Inverter Angle Minimization Based Control Approach for Dispatch of Distributed Energy Resources with Hybrid Energy Storage System”, Top 5 papers from IACC based on reviewer scores, from 300 submissions, for 2020.
- **Nominated for the best paper award**, IEEE IAS AM, 2019 (from IACC), “Coordinated Voltage Control Strategy for Voltage Regulators and Voltage Source Converters Integrated Distribution System,” in IEEE Transactions on Industry Applications”, Top 10 papers from IACC based on reviewer scores, from 300 submissions, for 2019.
- **Best paper finalist**, IEEE ISGT NA, 2021 Top 7, A Graph Theory-Based Two-Level Spectral Clustering Approach for Active Power Grouping of DER Integrated Power Distribution System.
- **Second best prize paper award**, “Prediction and Enhancement of Power System Transient Stability Using Taylor Series”, IEEE NAPS conference, 2018.

- **First prize paper award**, IEEE PECT conference, “An approach based on potential energy balance for transient stability improvement in modern power grid”, 2018.
- **Invited Workshop**, U.S.-India State & Urban Initiative at CSIS, Washington, D.C., 2017.
- **First prize paper award**, “Design and real-time implementation of optimal power system wide-area system-centric controller based on temporal difference learning” Industrial Automation and Control Committee (IACC), in the 2015 IEEE Industry Applications Society Annual Meeting.
- **Best conference papers**, “An Approach for Micro grid Management with Hybrid Energy Storage System Using Batteries and Ultra Capacitors” IEEE PES General Meeting, 2014.
- **National Science Foundation**, Faculty Early CAREER Award, 2007.  
[https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=0748238](https://www.nsf.gov/awardsearch/showAward?AWD_ID=0748238),  
[https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1063484](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1063484)
- **Nominated for Outstanding Teaching Award**, College of Engineering, UNC Charlotte, 2015 and 2018.
- **IEEE Charlotte section citation of appreciation for service Excellence**, IEEE Charlotte section, PES Chair, 2013-2016.
- **Listed Marquis Who’s Who in the World and Who’s Who in Science and Engineering**, 2007.
- **Nominated as Star Researcher**, The University of West Florida, FL, 2010
- **NSF AIS Award**, 2013.  
[https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1309911&HistoricalAwards=false](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1309911&HistoricalAwards=false)
- **NSF EPCN Award**, 2018,  
[https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1810174&HistoricalAwards=false](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1810174&HistoricalAwards=false)
- **Best student poster award**, IEEE PES GM, 2021, <https://ewh.ieee.org/soc/pes/sasc/awards.html>
- **Best student poster Award**, IEEE T&D 2016.
- **Third Best Student Poster Award**, IEEE PES T&D, 2012
- **Best Student Poster Award**, IEEE PES GM, 2011
- **Myron Zucker design contest award from IEEE IAS**, 2007.
- **Norwegian Scholarship for graduate studies**, Top (only one award) from the country, 1998.

#### **International and National Recognition including Guest Lectures and Panels (Selected)**

- **Invited Webinar**, IEEE PES, “Optimal Reconfiguration and Resilient Control Framework for Real-Time Photovoltaic Dispatch with Inverter Based Resources”, 2022.
- **Keynote speaker**, 2nd Electric Power, and Renewable Energy Conference (EPREC-2021), 2021.  
<https://www.eprec.co.in/previous-events/eprec-2021/keynote-speakers>
- **Invited Webinar**, “Decision Support and Data-Driven Management of Electric Grid, December 2020” IEEE Miami Section, Industry Applications Society Chapter, and the Department of Electrical & Computer Engineering, FIU, 2020. Events « IEEE Miami Section
- **Keynote Speaker**, 13th IEEE PES Asia Pacific Power, and Energy Engineering Conference, IEEE APPEEC 2021. <https://ieee-appeec.org/2021-speakers/>
- **Invited General Co-Chair**, IEEE PESGRE 2024 sponsored by IEEE IAS, PES, IES, and PELS. (<https://pesgre2022.org/committee/>)
- **Steering Committee Member**, IEEE PESGRE, 2022 sponsored by IEEE IAS, PES, IES and PELS (<https://pesgre2022.org/committee/>)
- **IEEE IAS Council Member**, IEEE IAS, 2020-2021. <https://ias.ieee.org/about-ias/council-listing.html>
- **Technical Program Committee Co-Chair**, Annual International Conference on Power, Energy, and Innovations (ICPEI), 2021. <https://www.egat.co.th/home/wp-content/uploads/2021/10/Abstract-Book-ICPEI2021.pdf>
- **Technical Program Committee**, IEEE International Power and Renewable Energy Conference (IPRECON), 2021. <https://www.iprecon2021.org/committee.html>

- **Technical Committee Member**, 4th International Conference on Electrical Systems, Technology and Information (ICESTI 2019), Bali, Indonesia, <http://www.icesti.org/committee/>
- **International Advisory Committee Member**, Intelligent Control and Computation or Smart energy and Mechatronic Systems, ICCSEMS-2020, <https://aktu.ac.in/pdf/collegenewsandevent/ICCSEMS-2020%20brochure.pdf>
- **General Chair**, 2nd Electric Power and Renewable Energy Conference (EPREC-2022), Sponsored by IEEE IAS, <https://www.eprec.co.in/organizing-committee>
- **Technical Program Committee**, IEEE IAS Annual Meeting, 2020, 2021.  
<https://ias.ieee.org/2021annualmeeting/meeting-committee.html>,  
<https://ias.ieee.org/2020annualmeeting/meeting-committee.html>
- **Tutorial Presentation**, PESGRE, 2020. <https://pesgre2022.org/wp-content/uploads/2021/09/Brief-Report-PESGRE2020.pdf>
- **Keynote speaker**, IEEE International Conference on Futuristic technologies in Control systems and Renewable energy (ICFCR 2020), 2020.  
<https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9249979>
- **Invited Speaker**, US-Turkish Workshop titled as “Smart Grid and Computational Approaches” supported by Tubitak (Kadir Has University, 2018). [http://species-society.org/wp-content/uploads/2020/03/Istanbul\\_info.pdf](http://species-society.org/wp-content/uploads/2020/03/Istanbul_info.pdf)
- **Invited Panelist**, National Science Foundation, Engineering Directorate.
- **Invited Panelist**, IEEE Kerala Section, IEEE Day Celebrations, 2020.  
<https://enotice.vtools.ieee.org/attachments/download/5260>, <https://drive.google.com/file/d/1Zy-EhE6JczdIHICK31jqafiEbelVTBk1/view>
- **Invited Talk**, International Conference on Power, Control and Embedded Systems, ICPCES 2014 Chennai, India A New Approach for Modern Power Grid Optimization and Control with High Penetration of Uncertain Energy Resources.
- **Invited Panel presentation** – “Use case of T&D Dynamic Co-Simulation, “Recent Advances on Integrated Transmission and Distribution Dynamic Simulation” at IEEE PES General Meeting, July 2021.
- **Invited Panel presentation** – “Management and Control of Distributed Energy Resources (DERs) with Battery Energy Storage”, “Technological Advances and Implementation Experiences of Battery Energy Storage Related Applications for Modern Power Grid”, at IEEE PES General Meeting, July 2022.
- **Invited Panel presentation** – “Accurate Equipment Modeling Techniques for Scalable Distribution Optimal Power Flow (OPF), Part I and Part 2”, Recent Advances in Optimal Power Flow Methods for Realistic Power Distribution Network, jointly with Prof. Sumit Paudyal, Florida International University (FIU), at IEEE PES General Meeting, July 2020.
- **Invited Panel presentation** – “Education and research on Inverter-Based Resources, “EMT Modeling of Inverter-based Resources: Education and R&D” at IEEE PES General Meeting, July 2022.
- **Invited Panel presentation** – “Data-Driven Management and Control of Power Distribution System” “Novel Interdisciplinary Approaches for Power and Energy Research and Education” at IEEE PES General Meeting, July 2020.
- **Invited Panel presentation** – “Machine Learning for Power System Modeling and Control, “Application of Data-Driven Methods on Power System Oscillation Characterization and Mitigation” at IEEE PES General Meeting, July 2020.
- **Invited Panel presentation** – “Theoretical Perspective of the Forced Oscillations and Their Signatures, “Technological Advances and Implementation Experiences of Battery Energy Storage Related Applications for Modern Power Grid” at IEEE PES General Meeting, July 2018.
- **Invited Panel presentation** –Real-Time Distributed Optimization and Wide-Area Control in the Power Grid, Panel Session, Computational Infrastructure for Distributed Control in the Power Grid, IEEE PES GM 2018.



- **Invited Workshop** - Optimal Battery Energy Storage Smart Management System for Multiple Value Streams Using Weather Patterns, Tom Fenimore, Sherif Abdelrazek, DistribuTech 2016, Industry-University Workshop,  
<https://digital.pennwell.com/pennwellevents/2016dtechshowguide?pm=2&pg=91#pg91>
- **Invited Workshop** – Battery Energy Storage Management Systems Control Considering Multiple Functions, Tom Fenimore, Johan Enslin, Dan Sowder, Sherif Abdelrazek, DistribuTech 2015, Industry-University Workshop,  
[https://digital.pennwell.com/pennwellevents/dtech\\_2015\\_showguide?pm=2&pg=18#pg18](https://digital.pennwell.com/pennwellevents/dtech_2015_showguide?pm=2&pg=18#pg18)
- **Invited Tutorial:** Mathematical Optimization in Active Power Distribution Systems, 2021 PES ISGT Tutorial Series [https://resourcecenter.ieee-pes.org/education/tutorials/PES\\_ED\\_TUT\\_MODS\\_020121.html](https://resourcecenter.ieee-pes.org/education/tutorials/PES_ED_TUT_MODS_020121.html)
- [https://resourcecenter.ieee-pes.org/education/tutorials/PES\\_ED\\_TUT\\_MODS2\\_020521.html](https://resourcecenter.ieee-pes.org/education/tutorials/PES_ED_TUT_MODS2_020521.html), Along with Anamika Dubey, Sumit Paudyal, Sukumar Kamalasadan
- **Invited Panelist**, Energy Storage and Delivery: Smart Grid; Systems, and Photovoltaics, “A Global Maximum Power Point Tracking System for Regional Photovoltaic Systems” Florida Energy System Conference, 2010, <http://floridaenergy.ufl.edu/fesc-conferences/fesc-summit/2010-summit/2010-session-presentations/>
- **Invited Webinar**, JSS Academy of Engineering, Renewable Energy Integration to the power grid: Challenges and Opportunities, July 2020.
- **Invited Seminar**, “Recent Advances in Real-Time Modeling and Distributed Control of Modern Power Grid” Michigan Technology University, 2019.  
[https://events.mtu.edu/event/recent\\_advances\\_in\\_real-time\\_modeling\\_and\\_distributed\\_control\\_of\\_modern\\_power\\_grid?utm\\_campaign=widget&utm\\_medium=widget&utm\\_source=Michigan+Tech+Events+Calendar](https://events.mtu.edu/event/recent_advances_in_real-time_modeling_and_distributed_control_of_modern_power_grid?utm_campaign=widget&utm_medium=widget&utm_source=Michigan+Tech+Events+Calendar)

### **III Demonstrated Leadership**

#### **University Level**

- Director of Power, Energy Intelligent Systems Lab ([www.peisl.uncc.edu](http://www.peisl.uncc.edu)) 2004- Current
  - This lab is a research facility for power and energy research founded in 2004 under my supervision.
  - Total investment of \$1.5 M that includes real-time simulation capabilities, Control and Power Hardware-in-the-loop capabilities, real-time data streaming, analysis and analytics capabilities, modeling and control capabilities, Energy Management (such as DMS) capabilities that are directly linked to real-time simulation.
  - Multidimensional use includes testing and evaluation, applied research, fundamental research, model validations.
- Director of Duke Energy Smart Grid Lab ([www.desgl.uncc.edu](http://www.desgl.uncc.edu)) 2012-2019
  - This lab is a grid-enabled real-time operational facility, which has been set up under my leadership.
  - Total investment of \$ 5M that includes real-time simulation capabilities, Control and Power Hardware-in-the-loop capabilities, real-time data streaming, analysis and analytics capabilities, modeling and control capabilities, Energy Management (such as DMS) capabilities that are directly linked to real-time simulation.
  - Multidimensional use includes testing and evaluation, applied research, fundamental research, model validations.
- Member of Center for Advanced Power Engineering Research (CAPER) <http://caper-usa.com/>
  - I have been involved in developing policy documents for CAPER
  - CAPER includes multiple academic institutions and industry/utility partners.
- Associate, Energy Production Infrastructure Center (EPIC)

- Led several key roles as EPIC associate, including DESGL lab director, faculty and staff recruitment committee member, technical and strategic planning member to name a few.
- EPIC is a center that involves multiple departments from UNCC College of Engineering and Industry/utility partners.
- Faculty/Staff Governance at UNC Charlotte
  - Faculty Executive Committee, 2019-2022.
  - Faculty President, College of Engineering Faculty Association (2016-2017).
  - Faculty Council and Faculty Advisory group (2016, 2018, 2020, 2021-2022), <https://facultygovernance.charlotte.edu/faculty-council/members>
  - Departmental Tenure and Promotion Review Committee member and Chair, 2014-2015, 2011-2012
  - College-level Tenure and Promotion Review Committee (CRC) Member, 2017, 2018, 2020, and Chair, 2021.
  - Faculty Search Committee Member and Chair for several searches, 2013- current
  - Graduate Committee Chair, ECE, 2019-current, Member 2016-2017.
  - Research Coordinator, ECE, 2021-current.
  - Faculty Advisory Committee to the Provost, 2020-2021
  - College Tenure and Promotion Review Committee- Chair, 2022, Member 2019, Member 2017.
  - Member of EPIC Implementation Committee, 2012-2014.
  - Undergraduate Student Advisor, 2013-2017.
  - Undergraduate and Graduate Power System Program Technical lead, 2015.
  - Technical Thrust Group Chair for Power Systems, 2010-2012.
  - ABET review committee, Member, ECE, 2011.
  - Undergraduate Honors Committee Member, 2017.
  - Program Standards Review Committee, 2016.
  - Undergraduate Concentration in Power and Energy Systems –Faculty Point of Contact - 2013-2017.
- Faculty/Staff Governance at University of West Florida
  - Academic Technology Advisory Committee—Member: August 2005-2010.
  - University Planning Committee (Facilities Planning) –Voting Member: August 2005–2010.
  - Scholarly and Creative Activities Committee –Voting Member: October 2005-August 2007.
  - Undergraduate Honors Committee- Voting Member: October 2006 – 2010.
  - Program Standards Review Committee- Voting Member: March 2007 – 2010.

### **National and International level (IEEE and non-IEEE Activities)**

- IEEE PES NAPS Steering Committee, 2017-2022.
- Member of IEEE Power System Dynamics and Control Committee, 2014-current.
  - Oscillation Source location Taskforce, power system stability controls subcommittee, Contributor to “forced oscillation in power systems” technical report.
  - Member, Task Force on Dynamic System Equivalents, Contribution to Technical Paper on “Application of Balanced Realizations for Model-Order Reduction of Dynamic Power System Equivalents”, Transaction Paper, 2016 (See J 35, paper journal).
- Member of IEEE AMPS committee, distribution system subcommittee.
  - IEEE PES Tutorial Contributor on “Mathematical Optimization in Active Power Distribution Systems”, ISGT conference, 2021 and 2022 Top listed for number or registration.
- Member of IEEE PES, Transmission and Distribution Committee, Distribution Subcommittee, 2019-current.

- IEEE PES Transmission and Distribution Committee, Distribution Subcommittee, Contributor to the Task force on “Distributed Energy storage Integration”, IEEE Distributed Resources Integration Working Group, IEEE PES Distributed Energy Storage, Task Force.
- IEEE PES Transmission and Distribution Committee, Distribution Subcommittee, Contributor to the Task force on “DER Interconnection Technical Review”, IEEE Distributed Resources Integration Working Group, IEEE PES DER Interconnection Task Force.
- Member of IEEE PES, Power System Relaying Sub-Committee (<https://www.pes-psrc.org/membership/Directory.pdf>) (needs to be updated)
  - IEEE PES Power System Relaying Committee member for the following working groups (contributor to the respective, technical reports, guides, and standards)
  - J 18 working group, contributing to windfarm control
  - C 43 working group, contributing to oscillations on windfarms integrated weak grid.
  - C 45 working group, Wide-area monitoring, and control using machine learning and testing and evaluation with machine learning-based control.
  - P2030.12 - PSRC C38 working group, contributions on advances in power flow and management of a microgrid.
  - P2800.2 working group, Contributions on modeling and analysis of IBRs (just started).
- IEEE IAS, Industrial Automation and Control Committee, Secretary (2016-2017), Vice-Chair (2018-2019), Chair (2020-2021). <https://cmte.ieee.org/iacc/executive-committee/>
- Special Issue Guest Editor, IEEE Transactions on Industry Application, “Special Issue on Security, Reliability, Privacy, and Quality in Industrial Automation and Control, July/August 2020. <https://jolfaei.info/IEEE-Trans-IAS.html>.
- Special Issue Editorial Board, IEEE Transactions on Industry Applications, 2019-2020.
  - In this role, I have been a part of the special issue committee for IEEE IAS, where the proposals for the special issues are screened and selected. Also, overseeing the guest editor group and contributing to the editorship are some of the duties.
- Editor IEEE Transactions on Vehicular Technology (2018-current)
  - I am the editor in the section of Vehicular Electronics especially on systems and control areas along with electric/hybrid vehicles and controls.
- Technical Council member, IEEE IAS. 2020-2021. (<https://ias.ieee.org/about-ias/ias-roster/ias-department-roster>)
  - I am the technical program committee member from IACC and a technical council member for IEEE IAS.
  - In this role, I organized the IEEE IAS Annual meeting for 2020 and 2021.
- Long Range Planning Committee Member, Education, IEEE Power and Energy Society, 2020-2022.
  - I am a member of IEEE PES long-range planning committee, Subcommittee 4, education.
  - In this role, we have started initiatives on IEEE PES lifelong learning products and services offerings.
- Chair, IEEE Industry Application Society, Industrial Automation and Control Committee (IACC).
  - As the chair of this committee, I am a member of the Technical Program Committee for the IAS Annual Meeting
  - Coordinate the conference including paper acceptance for around 300 to 400 submissions.
  - Organize the papers to be sent out to IEEE Transactions for Industry Applications for review.
  - Manage committee meetings at least 3 times a year.
  - Reside at the IEEE IAS annual meeting committee meetings from IEEE IAS IACC.

- Member of publication committee from IEEE IAS.
- Member of Departmental committee at the MSDAD.
- Paper Review Chair (Area EIC) and active member IEEE IAS Industrial Automation and Control Committee (IACC) since 2009.
  - I have reviewed papers, organized sessions, and been a session chair for the IAS Annual meeting since then. Since January 2018, I have also been serving as a paper review chair for IACC (Area Editor-in-Chief for IACC committee) managing 12 associate editors and more than 200 papers annually. Also, I have been serving as Associate Editor for IEEE Transactions on Industry Applications.
- Chair of IEEE Power and Energy Society (PES), PES University, Selection, and Quality Control Committee, and member of PES since 2006. [https://www.ieee-pes.org/images/files/pdf/6.8\\_PES\\_U\\_Org\\_chart\\_names.pdf](https://www.ieee-pes.org/images/files/pdf/6.8_PES_U_Org_chart_names.pdf)
  - As IEEE PES officer, I have been tutorial, plain talk, webinar review, and selection Chair for all IEEE PES sponsored conferences since 2014. Since 2017, I have also been a Chair of IEEE PES, selection and quality control under the New Product and Development Committee.
  - Our committee selects the tutorials and webinars. The committee also checks the quality of the products that are presented and screened under IEEE PES.
  - I am also the Tech Liaison from PES University to IEEE PES Technical Council.
- Chair, IEEE PES Power and Energy Education Committee, (PEEC), 2022-2024.
  - Currently, I am the Chair of the PEEC. As a Chair, I am the Technical IEEE PES Tech council member.
  - Previous, I was the Vice-Chair of the PEEC. As a Vice-Chair, I am the Technical Committee Program Chair of IEEE PES Tech council.
  - From 2018-to 2019, I have been the secretary of IEEE PES Power, Energy Education Committee (PEEC).
  - PEEC is one of the standing technical committees of IEEE PES with around 200 members.
  - Participated in PEEC Operating Manual revision.
- PES Chair IEEE Charlotte section, 2013-2016.
  - Since 2010 and have been the Chair for the PES IEEE Charlotte section from 2013-2016.
  - During my tenure, several programs and distinguished lecture series were conducted.
- IEEE Charlotte Section Secretary-2014.
- International Advisory Committee, International Conference on Science and Contemporary Technologies (ICSCT), 2021. <https://icsct.bubt.edu.bd/international-advisory-committee/>
- Guest Editor, ICCSEMS-2020: Special Issue on: "Artificial Intelligence, Signal Processing and Mechatronics for Smart Energy Systems", International Journal of Energy Technology and Policy, <https://www.inderscience.com/info/ingeneral/cfp.php?id=5068>
- General Co-Chair, IEEE PES, North American Power Symposium, 2015
  - 280 attendees and 187 papers accepted. Supported students across the country.
  - Initiated and coordinated support from Industries and Utilities.
- General Chair, NC Smart Grid Forum, 2012
  - Around 150 smart grid experts met to discuss the status of smart grid technologies in NC. Main coordinator for the event.
- National Science Foundation Panelists, 2013-current
  - Participated in several panels as an invited panelist such as CAREER, CRISP, CPS, EPAS, EPCN, SSC. IIS.
  - NSERC Discovery Grant, Discovery Grant Program, Canada, 2015
- Other conference activities
  - Session Chair, IEEE NAPS, 2009-2015.

- Session Chair, IEEE IAS Annual Meeting 2010-2015.
- Session Organizer, IEEE IAS Annual Meeting 2010-2015.
- Program Committee Member, Florida Energy Systems Consortium (FESC) Energy Summit, Orlando, Florida, USA, 2010.
- Panelist, IEEE Power, and Energy Society General Meeting, 2011.
- Session(s) Chair, IEEE Southeastern Conference, Memphis, USA, 2006.
- Panelist, Research Student and Faculty Internal Grant, UWF.
- Evaluate and Judge, IEEE Southeast Con, Student paper and Ethics Competition
- Sessions Chair, International Conference on Artificial Intelligence
- Reviewer, Computer Applications Society
- Grant Refereeing (Adhoc)
  - NSF Panel: IIS, March 2007
  - NSERC Fellow Review
  - South Carolina State Smart Grid Consortium Review

### **Press Releases and Accomplishment Highlights (Selected)**

- Smart Grid lab matter: <https://enr.charlotte.edu/unc-charlotte-smart-grid-lab-getting-smarter>
- Duke Energy Smart Grid Lab Director, <https://enr.charlotte.edu/news/2017-09-08/duke-energy-smart-grid-laboratory>
- Battery Energy Storage System Management for Improving Grid Reliability, <https://enr.charlotte.edu/news/2017-06-15/battery-energy-storage-system-management-improving-power-grid-reliability>.
- Renewable Energy Advances in EPIC, UNCC, <https://enr.charlotte.edu/news/2018-06-21/college-engineering-advancing-future-solar-energy>.
- Department of Energy, SETO Project on Optimal Reconfiguration and Resilient Control Framework for Real-Time Photovoltaic Dispatch to Manage Critical Infrastructure, Website Launch (ReDis-PV), <https://www.redispv.org/>
- Department of Energy, SETO Project on Optimal Reconfiguration and Resilient Control Framework for Real-Time Photovoltaic Dispatch to Manage Critical Infrastructure, Press Release, <https://enr.charlotte.edu/news/2020-01-24/doe-awards-unc-charlotte-electrical-engineering-46-million-advance-solar-energy>
- Department of Energy, SETO Project on Optimal Reconfiguration and Resilient Control Framework for Real-Time Photovoltaic Dispatch to Manage Critical Infrastructure, Press Release, <https://ece.charlotte.edu/spotlights/ece-professor-wins-46m-doe-assist-award>
- Appeared in UNCC Millennial Magazine, [https://issuu.com/unc\\_charlotte/docs/millennial-spring-2012/31](https://issuu.com/unc_charlotte/docs/millennial-spring-2012/31)
- Appeared in IEEE PES Long-range planning meeting event blog, <https://m.facebook.com/ieeePES/photos/a.2847749998640309/2636427916439186/?type=3&source=54>
- Research Accomplishment Award Press release, <https://inside.charlotte.edu/news-features/2021-11-02/faculty-and-staff-recognized-research-accomplishments-illuminating-unc>
- Charlotte's Dynamic Energy Cluster Report: [http://nexgrid.net/library/Charlotte\\_Energy\\_2011.pdf](http://nexgrid.net/library/Charlotte_Energy_2011.pdf)
- Smart Grid Lab getting Smarter: <https://enr.charlotte.edu/unc-charlotte-smart-grid-lab-getting-smarter>
- Tutorial Presentations at PESGRE2020: <https://iten.ieee-ies.org/general-news/2020/ieee-international-conference-on-power-electronics-smart-grid-and-renewable-energy-pesgre2020-a-highly-successful-inaugural-edition/>
- Steering Committee Member, PESGRE 2022: <https://pesgre2022.org/committee/>

- UTC Foundation Grant: <https://www.prnewswire.com/news-releases/utc-foundation-grant-to-unc-charlotte-epic-300452628.html>

## **Professional Affiliations and Service Activities (Selected)**

### **IEEE Memberships**

- IEEE Member/Senior Member 2000- Current
- IEEE Industrial Applications Society –Member: 2007- Current
  - Industrial Automation Control Committee—Member: 2009-Current
  - Industrial Automation Control Committee—ExCom Member: 2016-Current
    - Secretary 2016-2017, Vice Chair 2018-2019, Chair, 2020-2021, Past Chair, 2022- Current
  - IEEE IAS Publication committee, 2017-Current
  - IEEE IAS Annual Meeting Committee, 2017-Current
  - IEEE IAS Technical Council, 2017-Current
  - IEEE IAS MSDAD, 2017-Current
  - IEEE IAS, 2017-Current
- IEEE Power & Energy Society – Member: 2002-Current.
  - Power Systems Analysis, Computing, and Economic Committee—Member: 2007- Current.
    - Intelligent System Subcommittee – Member: 2007- Current.
    - Multi-agent Systems Taskforce – Member: 2007- Current.
    - Intelligent Control Systems Taskforce – Member: 2007- Current.
  - Power Systems Dynamic Performance Committee – Member: 2007- Current.
    - Oscillation Task Force Sub Committee – Task Chair: 2017-2018.
    - Power System Stability Subcommittee – Member: 2007- Current.
      - Voltage Stability Focus Group – Member: 2007- Current.
    - Power Energy Education Committee – Secretary: 2018- Current
      - Lifelong Learning Sub Committee- Chair 2014-2016
      - Lifelong Learning Sub Committee- Vice-Chair 2012-2014
      - Lifelong Learning Sub Committee- Secretary 2010-2012
    - New Product and Development Committee – Member: 2017-Current
      - Quality Control Sub Committee- Chair, 2017-Current
- IEEE Industrial Electronics Society –Member: 2007- Current
- IEEE Control Systems Society –Member: 2006- Current
- IEEE Power Electronics Society –Member: 2007- Current
- IEEE Computational Intelligence Society –Member: 2000- 2012

### **Other Memberships:**

- International Society of Computer Applications (ISCA) – Member: 2003- 2007.
- International Association of Engineers (IAENG) – Member: 2005- Current.
- POWERGLOBE– Member: 2005- Current.
- Florida Energy Systems Consortium (FESC) – Member 2009- Current

### **Review/Editorial Board/Advisory**

- West Florida Technical High school Advisory Board: Member 2005- 2010.
- SC Smart Grid Energy Center, Proposal Adhoc Reviewer, 2013.
- Associate Editor, IEEE Transactions on Industry Applications, 2013-2014, 2016- present
- Associate Editor, IEEE Transactions on Sustainable Energy, 2013.
- Guest Editor, IEEE Transactions on Sustainable Energy, 2012.

### **Manuscript Refereeing (Journal- Selected)**

- IEEE Transactions on Power Systems
- IEEE Transactions on Fuzzy Systems

- IEEE Transactions on Neural Networks
- IEEE Transactions on Education
- IEEE Transactions on Industry Applications
- IEEE Transactions on Industrial Electronics
- International Journal of System Science.
- Journal of Fuzzy Sets and Systems
- International Journal of Power and Energy Systems
- International Journal of Electric Power and Energy Systems
- Journal of Neural Computing and Applications
- Control Systems Practice
- International Journal of Adaptive Control and Signal Processing

### **Manuscript Refereeing (Conferences)**

- IEEE American Control Conference, 2008, 2007.
- IEEE Multi-conference on Systems and Control, 2007.
- IFAC World Congress, 2008.
- IEEE Conference on Decision and Control, 2008, 2007.
- IJME Intertech Joint International Conference, 2007.
- Student Poster Session, IEEE PES General Meeting, Tampa, FL, 2007.
- North American Power Symposium, 2007.
- IEEE Southeastern Conference, Memphis, USA, 2006.

### **Other Professional Activities and Accomplishments (Selected)**

#### **Conference Organizations and Services**

- CO1. General Co-Chair: North American Power Symposium (NAPS) 2015, 280 attendees and 187 papers accepted.
- CO2. Symposium Chair: NC Smart Grid Forum, 2012, 150 attendees and panel and paper sessions.
- CO3. Session Chair, IEEE NAPS, 2009-2015.
- CO4. Session Chair, IEEE IAS Annual Meeting 2010-2015.
- CO5. Session Organizer, IEEE IAS Annual Meeting 2010-2015.
- CO6. Program Committee Member, Florida Energy Systems Consortium (FESC) Energy Summit, Orlando, Florida, USA, 2010.
- CO7. Panelist, IEEE Power, and Energy Society General Meeting, 2011.
- CO8. Session(s) Chair, IEEE Southeastern Conference, Memphis, USA, 2006.
- CO9. Panelist, Research Student and Faculty Internal Grant, UWF.
- CO10. Evaluate and Judge, IEEE Southeast Con, Student paper and Ethics Competition
- CO11. Sessions Chair, International Conference on Artificial Intelligence
- CO12. Reviewer, Computer Applications Society

#### **Professional Development Activities**

- PT1. OPAL-RT Training, Hypersim, UNCC, 2014
- PT2. OPEN DSS training EPRI, 2013
- PT3. RTDS Training, UNCC, 2011
- PT4. Opal-RT Installation and Training eMegasim, UNCC, 2010.
- PT5. Matlab/Simulink training, AIT, 1999.
- PT6. International Conference on Computer Applications in Industry and Engineering, 2004.
- PT7. Labview training, UWF, 2005.
- PT8. Faculty workshops and new faculty orientations, Center for Teaching and Learning, 2005.
- PT9. Faculty workshops on Tenure and Promotion, Center for Teaching and Learning, UWF, 2005.
- PT10. International Conference on Artificial Intelligence, Pune, India, 2005.
- PT11. International Conference on Computer Applications in Industry and Engineering, 2006.
- PT12. IEEE southeastern conference, Memphis, USA, 2006.

- PT13. IEEE PES GM, Tampa, 2007, Pittsburg, 2008. Calgary 2009, NAPS, 2009  
PT14. IEEE IJCNN, Orlando, 2007, Atlanta, 2009.  
PT15. IEEE PES GM, IEEE IECON, Orlando, 2008.

#### ***IV Research and Scholarly Activities***

##### **Current Research**

- Control of Inverter Based Resources (IBR's) For grid-connected and islanded modes of operation
- Management of multiple IBRs in the power distribution system considering unbalances.
- Management of islanded distribution grid to improve resilience using distributed battery energy sources.
- Grid-level state estimation considering vulnerability, situation awareness, and attacks.
- Towards 100% IBR operated transmission and distribution grid: Challenges and Opportunities

##### **Career Highlights:**

- **More than 25 years of research, teaching, and industry experience in Power, Energy Systems, and Control Systems.**

##### **□ Demonstrated Contribution in Research**

- **Research Leadership: Team member of over \$12M in grants and contracts with individual contributions of more than \$7M.** The focus of research is to model and study the power grid with advanced tools and sensors, analyzing the challenges and proposing solutions such as wide-area monitoring and control, and b) understanding and providing mitigation strategies for renewable energy integration challenges such as energy system modeling and control. Funding from federal agencies such as the National Science Foundation (NSF), Department of Energy (DoE), state agencies, and industry/utility partners as grants and equipment support.
- **Research Contributions:** Made original research contributions in (a) Power System Modeling and control (b) Renewable Energy Integration, (c) Control of Energy Storage and experimental research on energy storage integration, and (d) Wide-area monitoring and control with ***more than 200 research articles (all peer-reviewed and archival type), 2 final patent, and 5 provisional or under preparation*** and innovations recognized nationally (National Science Foundation and energy industry groups).
- **Served/Serving as a PI or co-PI** for research funding/grant for more than \$10 Million from various federal agencies such as the National Science Foundation (NSF), Department of Energy (DoE), state agencies, and industry/utility partners as grants and equipment support.
- **Graduate Student Support and Advising:** Mentor, financial support, and main advisor for 60 graduate students. Strong record of student success rates for example 100% of the student placed in relevant industries such as national lab and utilities (for example SEL, Duke Energy, FPL, AEP, AREVA).
- **Awards and Honors:** Won various awards including the NSF CAREER award, NSF AIS award, Best paper award(s), and faculty mentor for Best Student Design from IEEE IAS Society.
- **Publications (Archival Type- Refereed):** First or co-author of over 200 research articles over 95% with students including a book, refereed book chapters, journal, and conference papers in intelligent and adaptive control, power systems, and computational intelligence.
  - **Published (Selected):** 1 book, 4 book chapters, 59 Peer-reviewed Journal papers, 150 peer-reviewed first-level (premier IEEE conferences) conference papers.



- **Under Review/Accepted:** 1 book, 5 Peer-reviewed Journal articles.
  - **Under Preparation:** 4 Peer-reviewed journal papers, 6 peer-reviewed conference papers.
  - **Total:** (Published, Under Review/Accepted): 2 books, 4 Book chapters, 64 peer-reviewed journal papers, 150 peer-reviewed conference papers.
- **Patents and Other Publications:** 2 Full patents, 5 provisional patents. Around 40 technical reports were submitted to federal agencies, and Duke Energy. Prepared several grant proposals and various reports for federal and state agencies.

#### □ **Demonstrated Contributions in Teaching**

- **Latest Course Developments:** In the last eight years, developed two new courses, ECGR 6147/8147- Power System Stability and ECGR 6190/8190- Smart Grid, Characteristics, and Design, Modified an existing course ECGR 4190/5142- Power Generation, Operation and Control. Student evaluation scores ~ 4.4 average.
- **Courses:** Taught various courses in Power systems such as Power system design, Power system dynamics, Power system stability, Power distribution systems, Power system control, and Computational Methods in Power systems, Control systems, Microcontrollers, Electric machines, and Intelligent systems(4 undergraduate and 4 graduate courses in Power and Control area)
- **Previous Course Developments:** Developed various courses in power systems and control systems and currently developing a four-course sequence including computational methods in power systems, Intelligent Systems, and Control applications to power and energy systems and energy system modeling and control.
- **Student Feedback:** Continuously rated as a top teacher by students. Twice nominated for outstanding graduate teaching award from the college of engineering. The strong success of undergraduate student mentorship. Evidence from the student senior design team winning competitions at the IEEE conferences and Senior design Exposition funded by the college of engineering (from around 200 teams with 80% industry-supported projects)
- **Industry workshop:** Conducted a four-course workshop for the local power company (Gulf Power, Subsidiary of Southern Company) including Voltage regulation, Motor control, and Lightning theory.
- **Student mentorship:** Advised/advising 59 graduate level and 11 undergraduate research level students, 78 Senior Design students, several exchange scholars, 3 post-doctoral trainees, several external thesis evaluations, and committee memberships. *Three best paper awards from IEEE conferences*, One *first prize undergraduate Poster* at IEEE PES General Meeting and *one third prize undergraduate poster*, and one *First prize undergraduate poster* at IEEE T&D Conference. *One first Prize and one-second prize* at UNC Charlotte Senior Design Exposition. One student received the *Myron Zucker Award* from IEEE IAS. Advised 60 undergraduate students every semester until Spring 2018.
- **Several undergraduate and graduate students (MS level) working in the power utility and industry including Duke Energy.**

#### □ **Professional Services**

- **Editorship:** IEEE Transactions on Industry Applications.
- **Associate Editorship:** IEEE Transactions on Industry Applications, IEEE Transactions on Sustainable Energy Systems.
- **Technical Reviewer:** Reviewed more than 150 technical articles submitted to IEEE transactions and other international journals.

- **Technical Activities:** Actively involved in IEEE Power and Energy Society and various subcommittees, performed various duties such as reviewer, panelist, judge, session chair for IEEE powersystems and intelligent system conferences.
- **Other Duties:** Performed duties on various departmental, college, and university committees.
- **Director Duke Energy Smart Grid Lab:** Designed and established the lab and provide leadership support for \$5 M research and operational funding from Duke Energy and other agencies.

### **Funded Research Grants and Contracts:**

**Total Funding (Competitive and noncompetitive): \$12,276,578.00 % Individual Share: 62.6% (((\$7,686,459.00))**

### **Competitive Funding**

#### **At the University of North Carolina at Charlotte - UNCC**

- CG1. Sukumar Kamalasadan (PI), Michael Smith (co-PI), “Digital Twin Power System Model for Hybrid Technology Configurations”, Siemens Energy, 2022, (\$100,000.00) – 50% Share.
- CG2. Badrul Chowdhury (PI), Sukumar Kamalasadan (co-PI), “ERC Planning Grant,” NSF, 2021, (\$99,000.00) – 20% Share.
- CG3. V. Cecchi (PI), Sukumar Kamalasadan (co-PI), Courtney Orr-Smith (co-PI), “Improving Student Learning in Power Engineering,” Siemens, 2019, (\$179,964.00) – 33% Share.
- CG4. Sukumar Kamalasadan (PI), “Stability and Control of Renewable Energy Integrated Power Grid with Synchronous Condensers and Flywheel,” Siemens, 2021, (\$30,000.00) – 100% Share.
- CG5. Sukumar Kamalasadan (PI), “Storage Integration Project- Phase VI,” Duke Energy Corporation, 2020, (\$152,740.00) – 100% Share.
- CG6. Sukumar Kamalasadan (PI), “Stability and Control of Renewable Energy Integrated Power Grid with Synchronous Condensers and Flywheel,” Siemens, 2020, (\$30,000.00) – 100% Share.
- CG7. Sukumar Kamalasadan (PI), Tao Han, “Optimal Reconfiguration and Resilient Control Framework for Real-Time Photovoltaic Dispatch to Manage Critical Infrastructure”, Department of Energy, Solar Technology Office 2019, (\$4,600,000) including 20% cost share - \$900,000, 70% Share.
- CG8. Badrul Chowdhury (PI), Sukumar Kamalasadan (co-PI), “Federated Architecture for Secure and Transactive Distributed Energy Resource Management Solutions (FAST-DERMS),” NREL, 2019, (\$192,000.00) – 50% Share.
- CG9. Sukumar Kamalasadan (PI), “Stability and Control of Renewable Energy Integrated Power Grid with Synchronous Condensers and Flywheel,” Siemens, 2019, (\$30,000.00) – 100% Share.
- CG10. Sukumar Kamalasadan (PI), Tao Han, “Data-Driven Operation and Control of Active Power Distribution Systems with High Penetration of Distributed Energy Resources and Energy Storage”, National Science Foundation, 2018, (\$360,000.00) – 90% Share.
- CG11. Sukumar Kamalasadan (PI), “Storage Integration Project- Phase V,” Duke Energy Corporation, 2018, (\$122,740.00) – 100% Share.
- CG12. Sukumar Kamalasadan (PI), “Modeling and Control of Flywheel Integrated power Grid,” GTS, 2017, (\$144,819.00) – 40% Share.
- CG13. Sukumar Kamalasadan (PI), “Cyber Security Studies of Communication enable Power Distribution System and Controller Design,” UTC, 2017, (\$22,400.00) – 100% Share.
- CG14. Sukumar Kamalasadan (PI), “Storage Integration Project- Phase IV,” Duke Energy Corporation, 2017, (\$122,883.00) – 100% Share.

- CG15. Sukumar Kamalasadan (PI); “Storage Integration Project- Phase III,” Duke Energy Corporation, 2016, (\$125,018.00) – 100% Share.
- CG16. M. Manjrekar (PI), B. Chowdhury, V. Cecchi, J. Enslin, S. Kamalasadan, “DC Bus Integration of BatteryEnergy Storage System with a Commercial PV Inverter System at Duke Energy's Mt. Holly Laboratory”(co-PI), 2016, Duke Energy Corporation, (\$57,380.00) – 10% Share.
- CG17. Sukumar Kamalasadan (PI), “Modeling and control of power grid with PV and energy storage”, Iris Energy, 2016, (\$17,000.00) – 100% Share.
- CG18. Sukumar Kamalasadan (PI), J. Enslin, “Modeling and control of power distribution system with energy storage”, A F Mensah, 2016, (\$163,017.00) – 90% Share.
- CG19. M. Manjrekar (PI), B. Chowdhury, V. Cecchi, J. Enslin, S. Kamalasadan, “Support towards enhancing simulation and testing capabilities at Duke Energy's Mount Holly Lab and UNCC's EPIC”, (co-PI), 2016, Duke Energy Corporation, (\$21,801.00) – 10% Share.
- CG20. V. Cecchi (PI), S. Kamalasadan, “North American Power Symposium student support program, 2015” (\$15,000.00) – 50% Share.
- CG21. Sukumar Kamalasadan (PI); Valentina Cecchi; Badrul Chowdhury; Johan Enslin; Madhav Manjrekar, “Hybrid Real-Time Simulator (OPAL-RT with RTDS) based Advanced Modeling and Analytical SystemSolutions of SCE Grid with Renewable Energy Resource and Storage”, Southern California Edison (SCE)Company, 2015, (\$150,000.00) – 70% Share.
- CG22. Sukumar Kamalasadan (PI); Johan Enslin, “Storage Integration Project,” Duke Energy Corporation, 2015,(\$82,244.00) – 90% Share.
- CG23. Sukumar Kamalasadan (PI); Valentina Cecchi; Johan Enslin, “Storage Integration Project “, Duke EnergyCorporation, 2013-2014, (\$89,354.00) – 70% Share.
- CG24. Sukumar Kamalasadan (PI), “AIS: Collaborative Research: A Novel Stochastic Dynamic Intelligent Grid Optimization Architecture for Modern Sustainable Power Grid”, NSF EPAS: 2013 (\$340,000.00) – 100%Share.
- CG25. Valentina Cecchi (PI); Johan Enslin; Sukumar Kamalasadan, “Photo Voltaic Generation Integration Study”, Duke Energy Corporation, 2012, (\$55,631.00) – 40% Share.
- CG26. Johan Enslin (PI); Valentina Cecchi; Sukumar Kamalasadan (co-PI), “MRI: Acquisition of Real-Time Digital Simulator for Real-Time Studies in Next-Generation Power Grid Infrastructure, 2012, (\$368,887.00) – 33% Share.
- CG27. Sukumar Kamalasadan (PI), “A new generation of a scalable intelligent supervisory loop-based algorithm for complex system control and optimization”, NSF CAREER: 2008 (\$296,750.00) – 100% Share.

**Total —19 PI and 8 co-PI (Combined): 7,965,578.00, % Individual Share: 75.00% (\$5,974,184.00)**

**At University of West Florida-UWF (Internal and External)**

- CG28. S. Kamalasadan (PI), “Implementation of Multiple Renewable Energy Source-based Micro-grid, Phase I and Phase II”, Internal Grant, 2010 (\$30,000.00) — 100% Share.
- CG29. S. Kamalasadan (PI), “Modeling and Simulation of Multiple Renewable Energy Source-based Microgrid”, Faculty SCAC Award, 2009 (\$2,000.00) — 100% Share.
- CG30. S. Kamalasadan (PI), “High-Performance Intelligent Control of Induction Machines”, Faculty SCAC Award, 2008 (\$2,000.00) — 100% Share.
- CG31. S. Kamalasadan (PI), “A new generation of a scalable intelligent supervisory loop-based algorithm for complex system control and optimization”, NSF CAREER: 2008 (\$103,250.00) — 100% Share.
- CG32. S. Kamalasadan (PI), “Designing intelligent adaptive controllers based on supervisory loop algorithms”, Faculty Summer Research Award, 2006 (\$7,500.00) – 100% Share.
- CG33. S. Kamalasadan (PI), “Developing intelligent adaptive controllers using supervisory loop techniques”, Faculty SCAC Award, 2005 (\$2,000.00) – 100% Share.

CG34. S. Kamalasadan, K Rasmussen (PI), “An end-to-end smart grid demonstration with hybrid energy storage and consumer-driven energy usage options” (Total proposed: \$16,698,428.00- UWF and Gulf Power Company with UWF share \$2,006,280.00 and Gulf Power Company sub-award, \$14,692,148.00) – 10% Individual Share, 2005.

**Total—6 PI and 1 co-PI (Combined): \$2,153,000.00, % Individual Share: 16.1% (\$347,375.00)**

**Total Funding—25 PI and 9 co PI: \$10,118,578.00 % Individual Share: 62.4% (\$6,321,559.00)**

**Non-Competitive Funding (% Share is a discount effort- Rest as Donations and Pledge)**

- Equipment supports from various industries: Fully designed the Duke Energy Smart Grid Laboratory in consultation with Energy Production and Infrastructure Center (EPIC). Involved in negotiation, demonstrations, and acquiring process for equipment funding from industry to Duke Energy Smart Grid Lab.

NCG1. PI Server negotiation and donation for the lab - \$611,000.00 – 100% Share

NCG2. OPAL-RT Hypersim platform negotiations - \$692,000 – 70% Share

NCG3. RTDS Real-time simulation negotiations – \$350,000 – 25% Share

NCG4. SEL Synchrophasor Test-bed - \$120,000 – 20% Share (Shared donations with Drs. Cox and Cecchi)

NCG5. The software’s for the lab set up – \$300,000 - 30% Share

NCG6. Server platform for the smart grid lab – \$85,000 – 80% Share

**Total Funding (Combined): \$2,158,000.00, % Individual Share: 63.2% (\$1,364,900.00)**

**Published Works:** (<https://scholar.google.com/citations?user=4TGyvY8AAAAJ&hl=en>)

**A. Book**

- B 1. S. Kamalasadan, “Novel Intelligent Adaptive Designs for the Control of Smart Systems”, Invited book, VDM Publishing House, ISBN 978-3639255102, June 2010.
- B 2. S. Kamalasadan et. al, “Optimization and Control of Modern Power Grid”, Cambridge Press, Under Preparation and Discussion.

**B. Book Chapters**

- BC1. S. Kamalasadan, Khalid S. Al-Olimat, Adel A. Ghandakly, “Design and Tuning of Intelligent Adaptive Power System Stabilizers Based on Supervisory Loop Concept”, Invited book chapter; *Accepted and In Print* in edited book “Intelligent techniques for power system generation”, by IEEE PES Intelligent Control Systems Working Group and IEEE CIS Power System Applications Task Force.
- BC2. S. Kamalasadan, James T. Haney and Chad M. Tanton, “Modeling and Control of a Hybrid Smart Micro-Grid Using Photo-Voltaic Arrays and Proton Exchange Membrane Fuel Cells”, Book Chapter, “Modeling and Control of Sustainable Power Systems Green Energy and Technology”, Springer 2012, pp. 209-247.
- BC3. S. Kamalasadan, Adel A. Ghandakly, “A Novel Intelligent Control Approach for Precise Tracking of Autonomous Robots”, “Design and Control of Intelligent Robotic Systems”, an edited book by Springer, "Studies in Computational Intelligence" Series, Vol. 177, pp. 227-254 ISBN: 978-3-540-89932-7 March 2009.
- BC4. S. Kamalasadan, Khalid S. Al-Olimat, “Fuzzy Logic Systems and Control”, Invited Book Chapter, Encyclopedia of Computer science and Engineering, edited by Benjamin Wah. John Wiley & Sons, Hoboken, NJ, ISBN: 978-0-471-38393-2, Vol 2, pp. 1344-1355, January 2009.

### **C. Peer-reviewed Journals Published**

- J1. AR Nair, R Bhattarai, M Smith, S Kamalasadan, "A Hybrid Adaptive Control Architecture for Grid-Connected Inverter with Optimal Policy Generation," IEEE Transactions on Industry Applications, Early Access, 2021.
- J2. Aniket Joshi, Sukumar Kamalasadan, "Optimal Robust Control Based on Partial Derivative Plant Approximation for Frequency Support Using Multiple DC Micro-grids," IEEE Transactions on Industry Applications, Early Access, 2021.
- J3. Tarik Chowdhury, Sukumar Kamalasadan, "A New Second-Order Cone Programming Model for Voltage Control of Power Distribution System With Inverter-Based Distributed Generation," IEEE Transactions on Industry Applications, Early Access, 2021.
- J4. Al Hasnain, Fahim and Hossain, Sheikh Jakir and Sukumar Kamalasadan, "A Novel Hybrid Deterministic-Stochastic Recursive Subspace Identification for Electromechanical Mode Estimation, Classification, and Control," IEEE Transactions on Industry Applications, vol. 57, no. 5, pp. 5476-5487, 2021.
- J5. A Joshi, A Suresh, S Kamalasadan, "Grid Frequency Regulation Based on Point of Common Coupling (PCC) Angle Deviation Control of Distributed Energy Resources with Fully Active Hybrid Energy Storage System," IEEE Transactions on Industry Applications, vol. 57, no. 5, pp. 4473-4485, 2021.
- J6. Abilash Thakallapelli, Sudipta Ghosh, Sukumar Kamalasadan, "Sensorless real-time reduced-order model-based adaptive maximum power tracking pitch controller for grid-connected wind turbines," in Electric Power Systems Research, vol. 194, pp.107-115, 2021.
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#### **D. Refereed Conference Proceedings (Peer Reviewed)**

##### **Archival Type**

- C1. F Atchison, V Cecchi, S Kamalasadan, "Improvement of Customer Class Load Schedules Utilizing AMI Measurements", 2021 North American Power Symposium (NAPS), pp.-6.
- C2. A. Abbas, R. Ariwoola and S. Kamalasadan, B. Chowdhury "Novel Protection Method for Fully Inverter-Based Distribution System Microgrid", 2021 North American Power Symposium (NAPS), pp.-6.
- C3. B. Banu, M. Smith, and S. Kamalasadan, "Evaluation of Hybrid Commercial Building Models for Grid Interactive Building Simulations", 2021 North American Power Symposium (NAPS), pp.-6.
- C4. V Cecchi, C Smith-Orr, F Atchison, S Kamalasadan, P Mandal, I Lopez, "Assessing Student Perceptions of Emerging Concepts in Power & Energy Systems via Concept Maps: Rubric Development", 2021 IEEE Frontiers in Education Conference (FIE), pp.-4.



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- C6. DAR de Jesús, P Mandal, T Senjyu, S Kamalasadan, " Unsupervised Hybrid Deep Generative Models for Photovoltaic Synthetic Data Generation," 2021 IEEE Power & Energy Society General Meeting (PESGM) pp.1-5.
- C7. A Suresh, S Kamalasadan, S Paudyal, " A Novel Three-Phase Transmission and Unbalance Distribution Co-Simulation Power Flow Model For Long Term Voltage Stability Margin Assessment," 2021 IEEE Power & Energy Society General Meeting (PESGM) pp.1-5.
- C8. M Al Mamun, S Paudyal, S Kamalasadan, " Real-Time Power System Dynamic Simulation using Windowing based Waveform Relaxation Method," 2021 IEEE Power & Energy Society General Meeting (PESGM) pp.1-5.
- C9. A Savasci, A Inaolaji, S Paudyal, S Kamalasadan, " Efficient Distribution Grid Optimal Power Flow with Discrete Control of Legacy Grid Devices," 2021 IEEE Power & Energy Society General Meeting (PESGM) pp.1-5.
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- C11. A Ingalalli, S Kamalasadan, " A Universal Multiple Inverter Control Architecture with Droop For Unbalanced Distribution Grid," 2021 IEEE Power & Energy Society Innovative Smart Grid Technologies (ISGT) pp.1-5.
- C12. S Patel, S Kamalasadan, " A Graph Theory-Based Two-Level Spectral Clustering Approach for Active Power Grouping of DER Integrated Power Distribution System," 2021 IEEE Power & Energy Society Innovative Smart Grid Technologies (ISGT) pp.1-5. **(Selected in Top 7 for Best Paper Award).**
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- C23. A Joshi, S Kamalasadan, "Inverter Angle Minimization Based Control Approach for Dispatch of Distributed Energy Resources with Hybrid Energy Storage System," 2020 IEEE Industry Applications Society Annual Meeting, 2020, pp. 1-5 **(Selected in Top 5 for Best Paper Award from IACC, IAS).**
- C24. AR Nair, R Bhattarai, M. Smith, S Kamalasadan, "Energy Function-Based Modified Integrated Control Architecture For Grid-Connected Inverter," 2020 IEEE Industry Applications Society Annual Meeting, 2020, pp. 1-5.
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- C38. A. Sahami and S. Kamalasadan, "Potential Energy Prediction Based Control for Transient Stability Enhancement," 2019 IEEE Industry Applications Society Annual Meeting, Baltimore, MD, USA, 2019, pp. 1-8
- C39. A. R. Nair, R. Bhattarai, and S. Kamalasadan, "A Sensorless Adaptive Grid Side Control Approach for Doubly Fed Induction Generator (DFIG)," 2019 IEEE Industry Applications Society Annual Meeting, Baltimore, MD, USA, 2019, pp. 1-10.
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- C49. M. Ahmed and S. Kamalasadan, "An Approach For Net-Load Management To Reduce Intermittency And Smooth The Power Output On Distribution Feeders With High PV Penetration," 2018 IEEE Industry Applications Society Annual Meeting (IAS), Portland, OR, 2018, pp. 1-9.
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- C53. A. Sahami, R. Yousefian, and S. Kamalasadan, "An approach based on potential energy balance for transient stability improvement in the modern power grid," 2018 IEEE Power and Energy Conference at Illinois (PECI), Champaign, IL, 2018, pp. 1-7. **(Best Paper Award)**
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- C55. R. Bisht, S. Subramaniam, R. Bhattarai, and S. Kamalasadan, "Active and reactive power control of single-phase inverter with seamless transfer between grid-connected and islanded mode," 2018 IEEE Power and Energy Conference at Illinois (PECI), Champaign, IL, 2018, pp. 1-8.
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- C57. Muhammad Ahmed, Rojan Bhattarai, Sheikh Jakir Hossain, Abdelrazek Sherif, S.Kamalasadan, "Coordinated voltage control strategy for voltage regulators and voltage source converters integrated distribution system, IEEE Industry Applications Society Annual Meeting, 2017.
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- C131. S. Kamalasadan, "A Composite Parallel Intelligent Controller for Multimodal and Uncertain Systems: Theoretical Formulation," In Proceedings of Modeling and Nonlinear Theory, IASTED conference, June 2007.
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- C150. S. Kamalasadan, Adel A. Ghandakly, Khalid Al-Olimat, “A Fuzzy Logic-based Multiple Reference Model Adaptive Control”, In Proceedings of the 16th International Conference of Computer Applications in Industry and Engineering, pp. 58-61, November 2003.

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- C152. S. Kamalasadan, Adel A Ghandakly, “An adaptive position tracking controller for permanent magnet stepper motors”, In Proceedings of International Conference on Automatic Control, ‘Automatica 2002’, Reference P – 089, Santiago de Cuba, July 2002, pp 101.

### **E. Patents and Patent Publications**

#### *Final*

- P1. Battery energy storage system controller systems and methods, S. Kamalasadan, SA Abdelrazek, JHR Enslin, DB Sowder, US Patent 10554048, 2020.
- P2. Grid-tied system controller including logic coupled to a photovoltaic station and an energy storage system, S Kamalasadan, SA Abdelrazek, JHR Enslin, DB Sowder, US Patent 9,843,189, 2017.
- P3. Grid-tied battery energy storage system controller systems and methods, S Kamalasadan, SA Abdelrazek, JHR Enslin, DB Sowder, Publication number: 20150333523, 2015.
- P4. Battery Energy Storage System controller systems and methods, Publication number: 20170085091, 2017.

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- P5. Arun Ravindran, Sukumar Kamalasadan, “Hierarchical Cross-Stack Dynamic Stochastic Optimal Control Framework for Energy-Aware Computing”, Patent Application #, US 61/735,169, Filing Date, 12/10/2012.

**F. Technical Reports (Selected)**

- T1. S. Kamalasadan, “Optimization and Control”, NSF AIS Award Annual Report, May 2017, 013991#4.
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- T3. S. Kamalasadan, “Optimization and Control”, NSF AIS Award Annual Report, May 2015, 013991#2.
- T4. S. Kamalasadan, “Optimization and Control”, NSF AIS Award Annual Report, May 2014, 013991#1.
- T5. S. Kamalasadan, “A new generation of a scalable intelligent supervisory loop-based algorithm for complexsystem control and optimization”, NSF CAREER Award Annual Report, October 2012, 0748238#5.
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- T10.S. Kamalasadan, “Prospectus in Renewable Energy based Distributed Generation and Grid Interface”,UWF Internal Report, October 2007.
- T11.S. Kamalasadan, “Micro-grid power module using hybrid renewable energy fuels, Internal Project Proposal Report”, December 2006.
- T12.J. Ames, S. Kamalasadan, “A tutorial on operational amplifier basics, circuit design and simulations usingMultisim”, Project report, December 2005.
- T13.S. Kamalasadan, “Intelligent adaptive controllers based on supervisory loop algorithms”, Summer Research Grant Report, September 2005.
- T14.S. Kamalasadan, “Self-tuning regulator techniques for position control of permanent magnet stepper motor” Research Project Report, December 2003.
- T15.S. Kamalasadan, “Intelligent adaptive control technique using fuzzy systems” – Technical Paper, December 2003. Research Project Report, May 2003.
- T16.S. Kamalasadan, “Real-time speed control of a DC Motor using C505C microcontroller”- Research ProjectReport, May 2001.

T17.S. Kamalasadan, “Artificial intelligence techniques in power systems applications”- Research Study Report, March 1999.

#### **G. Other Publications**

- O1. S. Kamalasadan, Y. Beaz, J. H. Enslin, Duke Energy Smart Grid Laboratory Yearly report, August 2014.
- O2. S. Kamalasadan, J. H. Enslin, Duke Energy Smart Grid Laboratory Yearly report, August 2013.
- O3. S. Kamalasadan, J. H. Enslin, Duke Energy Smart Grid Laboratory Yearly report, August 2012.
- O4. S. Kamalasadan, Mark Dreadin, “An end-to-end smart grid demonstration with hybrid energy storage and consumer-driven energy usage options”, Project proposal, Department of Energy, August 2009.
- O5. S. Kamalasadan, “Micro-Grid Power Module using Hybrid Renewable Energy Fuels”, Renewable Energy Project Proposal, Florida Renewable Energy Technologies Grant Program, October 2007.
- O6. S. Kamalasadan, “A new generation of a scalable intelligent supervisory loop-based algorithm for complex system control and optimization”- NSF Proposal, July 2007.
- O7. S. Kamalasadan “An Integrated Model for applied engineering Communication and Control Curriculum Improvement (AIM-C3I)” – NSF Proposal, May 2006.
- O8. S. Kamalasadan “Scalable Intelligent Supervisory Loop-based Learning and Adaptation Algorithms for the Control of Complex Systems: Global Action Evaluation Approach” – NSF Proposal, October 2006.
- O9. S. Kamalasadan, “A New Generation of Intelligent Agent Supervisory Loop-based Adaptive Controllers”- NSF Proposal, July 2005.
- O10. S. Kamalasadan, "A New Generation of Adaptive Control: An Intelligent Supervisory Loop Approach", Ph.D. Dissertation, ProQuest Digital Dissertation, Publication Number: AAT 3141223, ISBN 0-496- 88356-3, August 2004.
- O11. S. Kamalasadan, “A Neural Network Approach to Voltage Stability Assessment and Improvement”, Master’s Thesis, Library Catalog, ET-99-11, Asian Institute of Technology, School of Environment Resource and Development, Bangkok, Thailand, August 1999.

#### **H. Other Selected Professional Presentations and Posters:**

- P1. S Abdelrazek, S. Kamalasadan, T. Fenimore and Battery Energy Storage Controller for High Penetration of Photo-voltaic Power in Power Distribution System, DistribuTECH 2017.
- P2. Abdelrazek, S.A.; Kamalasadan, S.; Enslin, J., " PV Station Capacity Firming Utilizing Battery Energy Storage Systems with Short Term Historical Data Analysis & Weather Predictions," TechConnect World Innovation Conference and Exposition, National Harbor, MD, June 2015
- P3. Abdelrazek, S.A.; Kamalasadan, S.; Enslin, J., "An Approach for Battery Energy Storage Systems Active Power Dispatch for Renewables Integration and Energy Arbitrage Applications," Energy Storage Association Annual Conference and Exposition, Dallas, TX, May 2015
- P4. S. Kamalasadan, “Modern Power Systems Control—Novel Intelligent Adaptive concepts”, Department of Electrical and Computer Engineering, Florida State University, March 2007.
- P5. S. Kamalasadan, “Novel Intelligent Approaches to Modern Power Systems Control and Analysis” – Center for Advanced Power Systems (CAPS), Florida State University, March 2007.
- P6. S. Kamalasadan, “Multi-Agent Control Systems- An Intelligent Supervisory Loop Approach” University of Central Florida, Institute of Simulation and Training, June 2006.
- P7. S. Kamalasadan, “A Novel Intelligent Agent Supervisory Loop-based Control Algorithm for Dynamic Systems” – 2nd IICAI conference, Pune, India, December 2005.
- P8. S. Kamalasadan, “A PID Controller for Real-Time DC Motor Speed Control using the C505C Microcontroller” – 17th International Conference of Computer Applications in Industry and Engineering, Orlando, FL USA, November 2004.

- P9. S. Kamalasadan, “Intelligent Supervisory Loop algorithms for system modeling and control” – The University of West Florida, April 2004.
- P10. S. Kamalasadan, “A Fuzzy Logic-based Multiple Reference Model Adaptive Control” –16th International Conference of Computer Applications in Industry and Engineering, November 2003.
- P11. S. Kamalasadan, "Intelligent Adaptive Controller Design for Dynamic and Nonlinear Systems Control" – 24th Annual Sigma Xi Student Research Symposium 2003, University of Toledo.
- P12. S. Kamalasadan, "A New Generation of Adaptive Control- An Intelligent Supervisory Loop Approach" – College of Engineering, University of Toledo, April 2003.
- P13. S. Kamalasadan, "A Neural Network Approach to Voltage Stability Assessment and Improvement" – Poster Presentation at the SERD Bazaar, School of Environment Resource and Development, AIT Bangkok, Thailand, August 1998.

***I. Other Seminars and Invited Talks (Selected):***

- S1. S. Kamalasadan, Panelist, Southeast Grid Modernization, Charlotte Business Journal’s 2014 Energy Inc. Summit, 2016. Available: <http://www.bizjournals.com/charlotte/event/93991#eventDetails>, Last Accessed, Jan 12, 2016
- S2. Based on a Cyber-Physical System Infrastructure Using Multi-Input Sensing and Big Data Analytics, Workshop on Big Data Analytics in CPS: Enabling the Move From IoT to Real-Time Control, Held on April 13, 2015, in conjunction with CPS Week 2015
- S3. S. Kamalasadan, Optimization, and Control in Power Grid, Keynote speaker – International Power System Conference, Chennai, India, February 2014.
- S4. S. Kamalasadan, Optimization, and Control in Power Grid, Speaker – April 2014, EPIC Seminar Series.
- S5. S. Kamalasadan, Invited Speaker – April 2012, NC Smart Grid Forum, [Online], Available: <http://www.sustainablegreenville.com/apps/calendar/showEvent?calID=2362460&eventID=177976987&next=%2FshowWeek%3FcalID%3D2362460%26year%3D2012%26month%3D4%26day%3D3>
- S6. S. Kamalasadan, “Intelligent Systems in Modern Power Systems”— the University of South Florida in February 2009.
- S7. S. Kamalasadan, “Modern Power Systems Control: Novel Intelligent Adaptive Concepts”— Florida State University, March 2007.
- S8. S. Kamalasadan, “Novel Intelligent Approaches to Modern Power Systems Control and Analysis” – Center for Advanced Power Systems (CAPS), Florida State University, March 2007.
- S9. S. Kamalasadan, “Multi-Agent Control Systems- An Intelligent Supervisory Loop Approach” University of Central Florida, Institute of Simulation and Training, June 2006.
- S10. S. Kamalasadan, “Agent-Based Control Algorithms: An Intelligent Supervisory Loop Approach” – ACM General Meeting, The University of West Florida, January 2006.
- S11. S. Kamalasadan, “Intelligent Supervisory Loop algorithms for system modeling and control” – The University of West Florida, April 2004.

***V Teaching and Advising/Mentoring/ Collaborations*****Statement of Teaching Interest and Philosophy:**

Teaching and research are the quintessence of academic life. It is important to apply aspects of one's research into the curriculum and share new information and technical advances with students, through teaching. As a teacher, one's purpose should go beyond reciting a textbook. Through continuous dialogue, the teacher should encourage students to acquire knowledge and incite independent thinking. All of the above ideas about teaching have been inspired by my own teaching experience over the years, which brought me a lot of satisfaction.

**TEACHING:**

**At the University of North Carolina at Charlotte: Fall 2010-present**

**At University of West Florida: Fall 2004-Summer 2010**

**Courses Taught (Selected Course taught at UNC Charlotte is listed)**

Year	Semester	Course No./Title	Cr. Hrs.	Enrollment
2021	Spring	ECGR 6890/8890: Individual Study and Projects	3	5
2021	Spring	ECGR 4190/5142: Power Generation Operation and Control	3	12
2020	Fall	ECGR 6890/8890: Individual Study and Projects	3	4
2020	Fall	ECGR 6190/8190: Smart Grid Characteristics and Design	3	14
2020	Spring	ECGR 4190/5142: Power Generation Operation and Control	3	18
2020	Spring	ECGR 6890/8890: Individual Study and Projects	3	2
2019	Fall	ECGR 6190/8190: Computational Methods in Power Sys.	3	12
2019	Fall	ECGR 6890/8890: Individual Study and Projects	3	2
2019	Spring	ECGR 4190/5142: Power Generation Operation and Control	3	14
2019	Spring	ECGR 6147/8147: Power System Stability and Control	3	11
2019	Spring	ECGR 6890/8890: Individual Study and Projects	3	2
2018	Fall	ECGR 6890/8890: Individual Study and Projects	3	2
2018	Fall	ECGR 6190/8190: Smart Grid Characteristics and Design	3	17
2018	Spring	ECGR 4190/5142: Power Generation Operation and Control	3	18
2018	Spring	ECGR 6890/8890: Individual Study and Projects	3	2
2018	Spring	ECGR 6147/8147: Power System Stability and Control	3	11
2017	Fall	ECGR 6190/8190: Computational Methods in Power Sys.	3	12
2017	Fall	ECGR 6090/8090: Special Topics: Power System Control	3	9
2017	Fall	ECGR 6890/8890: Individual Study and Projects	3	2
2017	Spring	ECGR 4190/5142: Power Generation Operation and Control	3	18
2017	Spring	ECGR 6890/8890: Individual Study and Projects	3	2
2017	Spring	ECGR 6147/8147: Power System Stability and Control	3	11
2016	Fall	ECGR 6190/8190: Computational Methods in Power Sys.	3	12
2016	Fall	ECGR 6190/8190: Smart Grid Characteristics and Design	3	17
2016	Fall	ECGR 6890/8890: Individual Study and Projects	3	2
2016	Spring	ECGR 4190/5142: Power Generation Operation and Control	3	14
2016	Spring	ECGR 6147/8147: Power System Stability and Control	3	11
2016	Spring	ECGR 6890/8890: Individual Study and Projects	3	2

2015	Fall	ECGR 6190/8190: Smart Grid Characteristics and Design	3	17
2015	Fall	ECGR 6090/8090: Intelligent Control in Power Systems	3	9
2015	Fall	ECGR 6890/8890: Individual Study and Projects	3	1
2015	Fall	ENGR 3210: Senior Design Laboratory	3	3
2015	Summer	ECGR 3142: Electro-Magnetic Devices	3	10
2015	Spring	ECGR 4190/5142: Power Generation Operation and Control	3	25
2015	Spring	ECGR 6147/8147: Power System Stability and Control	3	11
2015	Spring	ECGR 6890/8890: Individual Study and Projects	3	2
2015	Spring	ECGR 6090/8090: Power System Control	3	9
2015	Spring	ENGR 3210: Senior Design Laboratory	3	7
2014	Fall	ECGR 6190/8190: Smart Grid Characteristics and Design	3	19
2014	Fall	ECGR 6090/8090: Smart Control in Power Systems	3	9
2014	Fall	ECGR 6890/8890: Individual Study and Projects	3	1
2014	Fall	ENGR 3210: Senior Design Laboratory	3	4
2014	Summer	ECGR 3142: Electro-Magnetic Devices	3	5
2014	Spring	ECGR 4190/5142: Power Generation Operation and Control	3	12
2014	Spring	ECGR 6890/8890: Individual Study and Projects	3	4
2014	Spring	ENGR 3210: Senior Design Laboratory	3	4
2013	Fall	ECGR 6090/8090: Smart Grid Characteristics and Design	3	12
2013	Fall	ECGR 6890/8890: Individual Study and Projects	3	3
2013	Summer	ECGR 3142: Electro-Magnetic Devices	3	16
2013	Spring	ECGR 6090/8090: Smart Grid Characteristics and design	3	14
2013	Spring	ECGR 6890/8890: Individual Study and Projects	3	4
2012	Fall	ECGR 4190/5142: Power Generation Operation and Control	3	16
2012	Fall	ECGR 6890/8890: Individual Study and Projects	3	9
2012	Summer	ECGR 3142: Electro-Magnetic Devices	3	15
2012	Spring	ECGR 6090/8090: Smart Grid Characteristics and Design	3	16
2012	Spring	ECGR 6890/8890: Individual Study and Projects	3	5
2011	Fall	ECGR 4190/5142: Power Generation Operation and Control	3	16
2011	Fall	ECGR 6090/8090: Smart Grid	3	9
2011	Summer	ECGR 3142: Electro-Magnetic Devices	3	9
2011	Spring	ECGR 4104/5104: Comp. Methods in Power Systems	3	14
2011	Spring	ECGR 6890/8890: Individual Study and Projects	3	1
2010	Fall	ECGR 4190/5142: Power Generation Operation and Control	3	17

**Total Number of courses: 62**

### **Selected Recent Educational Activities**

#### **Course Restructuring and Development**

- Smart Grid Characteristics and Design (at UNCC): Designed and developed a new course related to powergrid modernization.

- Power System Stability (at UNCC): Designed and developed a new course related to power system stability.
- Power Generation Operation and Control and Electromagnetic Devices (at UNCC): A modified existing course in Power Generation Operation and Control and Electromagnetic Devices
- Introduced a new course in Control System (at UWF) –Fall 2006: Developed a new course in control systems technology. The course aims at delivering theoretical and practical knowledge in digital and analog control methods. The course component includes laboratory experience and a class project.
- Revised an existing course in Electric Power Systems (at UWF)–Fall 2004: Revised the course outline, course objectives, and syllabus incorporating details in modern power system technology and enhancing student learning outcomes. Developed the syllabus and introduced simulation lab experiments.

### **Other teaching-related activities**

- Revised program curriculum to reflect changes in the existing course plan and introduced new courses. Developed new curriculum change requests and plans to enhance the existing curriculum structure.
- Developed four courses for the local power company (Gulf Power) professionals as a 4-day workshop including Motor Control, Lightning Theory, and Voltage Regulation.

### **Participation in Professional Development Activities Related to Teaching**

- April 9–10, 2015, Attended faculty workshop on “Reforming electric energy systems curriculum with emphasis on sustainability, Washington, DC.
- 2014, Faculty Mentoring Program, The Advance Faculty Affairs office, UNC Charlotte.

\*Senior Design Laboratory course assignment started in Spring 2014. For mentorship details please see section “Student Advising and Graduate Supervision”

### **Graduate and Undergraduate Teaching Evaluation (Selected)**

Semester	Course Name	Level	Overall Respondent	Effectiveness	Learning
Spring 2020	Power Generation	Undergraduate/ Graduate	7/12	4.29	4.29
Spring 2020	Individual Study	Graduate	2/5	5.0	4.75
Fall 2020	Smart Grid	Graduate	11/14	5.0	4.91
Fall 2020	Individual Study	Graduate	2/4	4.5	4.5
Summer 2020	EM Devices	Undergraduate	3/19	4.0	4.33
Spring 2020	Power Generation	Undergraduate/ Graduate	17/18	4.78	4.78
Spring 2020	Individual Study	Graduate	2/2	4.7	4.75
Fall 2019	Comp. Methods	Undergraduate/ Graduate	11/15	4.36	4.36
Fall 2019	Individual Study	Graduate	2/2	5.00	5.00
Summer 2019	EM Devices	Undergraduate	8/21	5.0	4.88
Spring 2019	Power Generation	Undergraduate/ Graduate	5/8	4.75	4.75
Spring 2019	Individual Study	Graduate	2/5	5.0	5.0
Spring 2019	Power System Stability	Graduate	6/7	4.5	4.5
Fall 2018	Smart Grid	Graduate	11/14	4.8	4.8
Fall 2018	Individual Study	Graduate	4/6	4.1	4.095

Summer 2018	EM Devices	Undergraduate	3/8	5.0	5.0
Spring 2018	Power Generation	Undergraduate/ Graduate	9/10	4.5	4.75
Spring 2018	Individual Study	Graduate	2/5	4.7	5.0
Spring 2018	Power System Stability	Graduate	7/8	4.5	4.75
Fall 2017	Smart Grid	Graduate	11/14	4.7	4.8
Fall 2017	Individual Study	Graduate	4/6	5.0	4.095
Summer 2017	Network Theory I	Undergraduate	2/8	5.0	5.0
Spring 2017	Power Generation	Undergraduate/ Graduate	10/11	4.4	4.25
Spring 2017	Individual Study	Graduate	1/3	5.0	5.0
Spring 2017	Power System Stability	Graduate	9/14	4.3	4.4
Fall 2016	Smart Grid	Graduate	13/14	4.1	4.0
Fall 2016	Individual Study	Graduate	1/2	5.0	5.0
Fall 2016	Comp. Methods	Undergraduate/ Graduate	9/9	4.4	4.56
Summer 2016*	EM Devices	Undergraduate	7/12	5.0	5.0
Spring 2016*	Power Generation	Undergraduate/ Graduate	13/14	4.77	4.69
Spring 2016*	Power System Stability	Graduate	9/8	4.5	4.5
Fall 2015	Smart Grid	Graduate	16/17	3.82	4.095
Fall 2015	Intelligent Control	Graduate	7/9	4.54	4.665
Fall 2015	Individual Study	Graduate	1/1	5.00	5.00
Summer 2015*	EM Devices	Undergraduate	7/10	4.5	4.0
Spring 2015*	Power Generation	Undergraduate/ Graduate	22/25	5	4.89
Spring 2015	Individual Study	Graduate	2/3	5	5
Fall 2014	Power System Control	Graduate	7/9	4.43	4.57
Fall 2014	Smart Grid	Graduate	17/19	4.38	4.44
Summer 2014*	EM Devices	Undergraduate	4/5	4.5	4.0
Spring 2014*	Power Generation	Undergraduate/ Graduate	9/12	5	4.89
Spring 2014	Individual Study	Graduate	2/3	5	5
Fall 2013	Individual Study	Graduate	2/3	4	4
Fall 2013	Power System Stability	Graduate	10/14	3.3	3.2
Summer 2013*	EM Devices	Undergraduate	16/16	3.8	3.9
Spring 2013*	Smart Grid	Graduate	7/9	4.43	4.57
Spring 2013	Individual Study	Graduate	4/5	5	4.5
Fall 2012*	Power Generation	Undergraduate/ Graduate	14/16	4	4
Fall 2012	Individual Study	Graduate	6/9	5	4.5
Spring 2012	Smart Grid	Graduate	14/16	4.00	3.97
Fall 2011	Power Generation	Undergraduate/ Graduate	16/16	4.56	4.6
Fall 2011	Power System Stability	Graduate	9/9	4.67	4.5

\*Qualitative Comments are not attached

Average Scores: 4.5 4.45



## **Student Advising and Graduate Supervision:**

### **Undergraduate Students:**

- 79 Previous Undergraduate Advisees
  - 5 senior design advisees in 2020 Fall (Forest Atchison, Kaylor Garcia, Jared McVeigh, Bryan Trawick, Srikar Vavilala), Project Title: Load profiles of customer classes and feeder voltage profiles, Funded by Duke Energy. **Third Prize in the Senior Design Exposition Spring 2021, from 200 students.**
  - 4 senior design advisees in 2019 Fall (M. Rodrigues, M. Nguyen, H. Read, R. Perkins, A. Mishra), Project Title: Load profiles of customer classes and Feeder voltage profile, Funded by Duke Energy.
  - 4 senior design advisees in 2019 Spring (Blake Herman, Ali Al-zouabi, Earl Lake, Michael Stiegler), Micro-Grid Control, design and simulation for UNCC Campus, Funded by SEL.
  - 4 senior design advisees in 2018 Fall (A. Simms, A Nisbett, M Tauber, S. Tomassi), Project Title: Meter and Device Placement for Duke Circuit Model - Phase 3, Funded by Duke Energy.
  - 4 senior design advisees in 2017 Fall (T. Bentley, G. Tucker G. Mathavan, C. Dehart), Micro Grid FEED study, design and simulation for UNCC Campus, Funded by SEL.
  - 4 senior design advisees in 2017 Fall (E. Alrobeh, M. Hurshe, M. Mehdawi, M. Monterrosa) Meter and Device Placement for Duke Circuit Model - Phase 2, Funded by Duke Energy.
  - 5 senior design advisees in 2017 Fall (J. Peeler, J. Stieglitz, K. Graham, R. Bailey, M. Spickelmier, Micro-grid design for a solar and battery energy storage facility, Funded by CAPER.
  - 5 senior design advisees in 2017 Spring (J. Ngocorai, A. Aldalooj, B. Patel, K. Her, L. Cole), CAPER Battery Energy Storage System (BESS) At Distribution Level, Funded by CAPER.
  - 5 senior design advisees in 2016 Fall (D. Watson, T. Rutledge, M. Romero, A. Patel, D. Higinson), PV Integrated Distribution Energy Management System with IVVC and Optimal Measurement, Funded by Duke Energy.
  - 3 senior design advisees in 2015 Fall (P. Rankin, E. Joniaux, J. Tribble), Project Title: Duke IDMS, Funded by Duke Energy. **IEEE PES T&D 2016 Student Poster Competition 1st place winner, Fall 2015 – Spring 2016.**
  - 4 senior design advisees in 2014 Fall (J. McCall, A. Scaria, B. Madden, C. Decoste), Project Title: Duke DMS for CRI Campus, Funded by Duke Energy, **Second Prize in the Senior Design Exposition, Fall 2014 from 200 students.**
  - 3 senior design advisees in 2014 Fall (S. Zilberdrut, D. McKenzie, R. Sherretts), Project Title: Automatic Reconfiguration Scheme and Load Management for UNCC Campus, Funded by SEL, **Second Prize in the Senior Design Exposition, Spring 2015, from 200 students. Joint with the Duke DMS team.**
  - 3 senior design advisees in 2014 Spring (D. Wilson, A. Al Matar, R.M. Al Onazy), Project Title: Modeling, Analysis and Management Strategies for Large Scale Renewables, Funded by Duke Energy.
  - 6 senior design advisees in 2013 Fall (N. Lee, J. Lee, R. Vo, B. Nguyen, J. Mukina, K. Fischer, Project Title: PV Battery Integrated Energy Management System, Funded by EPIC.
  - 6 senior design advisees in 2013 Spring (S. Malcolm, K. Taylor, D. Harrell, C. Sanders, J. Deveau, G. Zemaitis, Project Title: Variable Frequency Drive System, Funded by Shaw.
  - 3 senior design advisees in 2012 Fall (S. Jarvis, R. Romero, Wubshet, Project Title: Wind Powered Generator, Funded by SEL.
  - 3 senior design advisees in 2011 Fall (Drake Bowers, Josh Marcum, and Michael Simmons, Project Title: Predictive technologies and service life of electronic components, Funded by Duke Energy.
  - 3 senior design advisees in 2011 Fall (P. O'Connor, W. Bomela, M. Knudson, Project Title: Solar Grid-Connected Micro- Sources for Smart Grid Applications Project, Funded by Duke Energy, **Third Prize Poster Award at T&D Exposition, 2012.**

- 4 senior design advisees in 2011 Spring Matthew Bixler, Justin Shipley, Sebastian Hoyos, and Preston Finnie, Project Title: Grid-Connected Renewable and Modular Micro-Source for Smart Grid Applications, Funded by Duke Energy, **First Prize Poster Award at PES General Meeting in 2011.**

**Note 1:** Several of these undergraduates have joined to **work with Duke Energy.**

**Note 2:** Undergraduate student funding is \$3000 per senior design group supported by the industry through Industrial Solutions Laboratory at UNC Charlotte. This is not direct funding to the Mentor. The senior design project is for two semesters.

### **Graduate Students under Direct Supervision (MS and Ph.D. Level): Total: 59**

#### **Current Graduate Researchers: Ph.D. Level**

- GD1. A. Abd-Elkader, “Transient Stability Assessment Using Synchro-phasors”, Ph.D., Date of Graduation, Fall 2023.
- GD2. Biswajit Dipan Biswas, “Optimization and Control Methodologies of Large-Scale Inverter Based Device Integrated Power Distribution System”, Ph.D., Expected Date of Graduation, Spring 2021.
- GD3. Fahim Al-Hasnain, “Wide Area Control and Stability”, Ph.D., Expected Date of Graduation, Fall 2021.
- GD4. Ali Aygun, “Tentative Topic: Demand Response and Electrical Vehicle Management” Ph.D., Expected Date of Graduation, Fall 2021.
- GD5. Shyamal Patel, “Tentative Topic: Management of Power Distribution System for higher penetration of renewables”, Ph.D., Expected Date of Graduation, Fall 2021.
- GD6. Tarik Chowdhry, “Power system Optimization and Optimal Power Flow”, Ph.D., Expected Date of Graduation, Fall 2023.
- GD7. Olalekan Ogundairo, “Management of Renewable Energy Integrated Power Grid for Frequency Regulation”, Ph.D., Expected Date of Graduation, Fall 2023.
- GD8. Nasser Althaiban, “Power Distribution System Management with Regulators”, Ph.D., Expected Date of Graduation, Fall 2023.
- GD9. Aravind Ingallali, “Microgrid Control and Management”, Ph.D., Expected Date of Graduation, Fall 2023.
- GD10. Bilkis Banu, “Power distribution system protection with renewables”, Ph.D., Expected Date of Graduation, Fall 2023.
- GD11. Roopa Ramachandran, “Distribution System State-Estimation”, Ph.D., Date of Graduation, Fall 2024.
- GD12. Raheem Ariwoola, “Residential Building Modeling and Control”, Ph.D., Date of Graduation, Fall 2024.
- GD13. Md Shamim Hasan, “Distribution System Optimization”, Ph.D., Date of Graduation, Fall 2024.
- GD14. Mohammed Ali Al-Sheehany, “Wind Power Stability and Control”, Ph.D., Date of Graduation, Fall 2024.
- GD15. Sarmad Tariq, “Optimal Management of Power Grid with D-FACTS”, Fall 2023

#### **Graduate Students, Ph.D. Completed:**

- GD1. Arun Suresh, “Frequency Regulation and Control of Distributed Energy Resource Integrated Combined Transmission and Distribution Systems”, Fall 2021.
- GD2. Anuprabha Ravindran Nair, “Stability and Control of Storage and Flywheel Integrated Wind Energy System”, Ph.D., Fall 2021.
- GD3. R. Bisht, “Control and Stability Analysis of Unbalanced Power Distribution System with Active Energy Sources”, Ph.D., Spring 2021, Last known Employment—Duke Energy.
- GD4. A. Joshi, “DC-AC Micro-Grid Control and Optimization, Ph.D., Spring 2021, Last known Employment--ABB Corporate Research.
- GD5. W. Davis, “Phasor Measurement Unit based Situational Awareness in Modern Power Grid”, Ph.D., Fall 2020, Last known Employment—Duke Energy.

- GD6. J. Hossain, “Frequency-dependent real-time transient stability structure-preserving algorithm for modern power grid”, Ph.D., Expected Date of Graduation, Fall 2019, Last known Employment-Duke Energy.
- GD7. A. Sahami, “Energy Function-Based Analysis of Power System Stability”, Ph.D., Expected Date of Graduation, Fall 2019, Last known Employment—Dominion Energy
- GD8. A. Thakallapelli, “Power System Stability Analysis of Wind Farms using Integrated Transfer Oscillation Path”, Ph.D., Fall 2018- Last known Employment-GE Power-Grid Solutions.
- GD9. M. Ahmed, “Energy Storage Optimization and Forecasting for Multiple Function Applications”, Ph.D., Fall 2018. - Last known Employment-Energy Exemplar.
- GD10. R. Bhattarai, “Wind Generation Real-Time Control and Optimization”, Ph.D., Spring 2018- Last known Employment-Idaho National Laboratory.
- GD11. N. Gurung, “Power System Stability Analysis of Wind Farms using Adaptive Controllers”, Ph.D., Spring 2018- Last known Employment-ComEd.
- GD12. R. Yousefian, “A New Generation of Stochastic Adaptive Control Algorithms for Power System-Wide Area Control and Prediction”, Ph.D., Fall 2016-Last known Employment- S&C Electric.
- GD13. M. Moghadasi, “Novel Large-Scale Optimization Methodology for Distributed Generation Penetration in Smart Grid”, Ph.D., Fall 2016-Last known Employment-Open Systems International.
- GD14. R. Maharjan, “Voltage Stability Analysis of a Grid Integrated Wind Power System”, Ph.D., Fall 2016-Last known Employment-Rastriya Prasaran Grid Company Limited.
- GD15. S. Abdelrazek, “Multiple Function Battery Energy Storage Control and Management Architecture”, Ph.D., Graduated, Fall 2015 - Last known Employment-Duke Energy.
- GD16. M. Smith, “Advance Control Applications to Nonlinear System based on prediction and adaptation”, Ph.D., Graduated, Fall 2015- Last known Employment- UNC Charlotte.

Graduate Students (MS Thesis Level):

- GT1. S. Subramaniam. “Unbalanced Power Distribution System Management Using Single-Phase Inverters, MS Thesis Option, Summer 2018- Last known Employment-SEL.
- GT2. Lee Luis. “Scenario Generation and Reduction Based PV Integrated Unit Commitment”, Graduated, MS Thesis Option, Spring 2018 - Last known Employment-SEL.
- GT3. M S. Sheikh, “PMU based adaptive out of step protection and control using transient stability methods”, MS Thesis Option, Fall 2017 - Last known Employment-SEL.
- GT4. T. Paul, “Power Grid Optimization and Control in the presence of PV System”, MS Thesis Option, Spring 2016-Last known Employment-SEL.
- GT5. R. Bisht, “Harmonic Analysis and Active Filtering of PV Integrated Power System”, MS Thesis Option, Summer 2016- Last known Employment-Pursuing Ph.D.
- GT6. A. Joshi, “Advance Control Architecture for PV Integrated Power Grid”, Current, MS Thesis Option, Summer 2016-Last known Employment-Pursuing Ph.D.
- GT7. A. Patel, “Locational Marginal Pricing Based Optimal Power Flow with Energy Storage”, MS Thesis Option, Expected Date of Graduation, Fall 2016- Last known Employment- Pursuing Ph.D.
- GT8. T. Orjuela, “A Novel method for optimization and control of wind energy for increased penetration in the Smart Grid”, MS Thesis Option, Fall 2014-Last known Employment-Entrepreneur.
- GT9. G. Deshpande, “A novel hybrid architecture for combined voltage, reactive power and real power support in the microgrid”, MS Thesis Option, Fall 2013-Last known Employment-TDK.
- GT10. N. Kulkarni, “A New Method for Identification and Control of Wiener-type nonlinear systems”, MS Thesis Option, Fall 2014-Last known Employment-Rolls Royce.
- GT11. K. Desai, “Modeling and Control of a micro-turbine based parallel plug-in hybrid electric vehicle”, MS Thesis Option, Fall 2011-Last known Employment-SEL.

- GT12. A. Manickam, “Development of intelligent and secured algorithms for modern complex system control and protection”, MS Thesis Option, Summer 2011 Last known Employment-Right Scale.
- GT13. Gerald Swann, “Development of system-centric control approaches using neural networks for power system stabilization”, MS Thesis Option, Fall 2010-Last known Employment-General Dynamics.
- GT14. Nicholas Johnson, “A Global Maximum Power Point Tracking System for Regional Photovoltaic Systems”, Directed Research, MS Thesis Option, Summer 2009-Last known Employment-US Navy.
- GT15. Sam McGilvery, “An Intelligent Adaptive Controller Design based on Genetic Algorithm”, MS Thesis Option, Summer 2005- Last known Employment-Element Machinery,
- GT16. R. Buyyanapragada, “Structure-Preserving Energy Function-Based Analysis of the power grid”, MS Thesis Option, Spring 2015- Last known Employment-Ecojiva.

#### Graduate Students (MS Project Level):

- GP1. Cory Brown, “Experimental set-up of Microgrid for Fault Analysis”, MS Project Option, Spring 2022.
- GP2. R. Cashion, “Power quality analysis with renewables”, MS Project Option, Fall 2018.
- GP3. N. Sintala, “Analysis of Evaluation of Power Distribution System with Renewables”, MS Project Option, Fall 2018.
- GP4. Aniruddha Narkhede, “Modeling of Power Distribution System with Integrated Energy Storage”, MS Project Option, Spring 2018. Last known Employment-PECO Power Company.
- GP5. A. Potdar, “Reverse Mapping of Transmission line Impedance using fault data”, MS Project Option, Spring 2017. Last known Employment-Schneider Electric.
- GP6. Max Hartenstein, “Autonomous quadcopter Security Alarm System”, MS Project Option, Fall 2015 Last known Employment-Entrepreneur.
- GP7. M Bharadwaz, “Energy Storage Modeling in RTDS”, MS Project Option, Spring 2014. Last known Employment-Entrepreneur.
- GP8. J Liles, “Self-Healing Network Modeling and Control”, MS Project Option, Spring 2013, Last known Employment-Florida Power and Light.
- GP9. H Norman, “Power System Restoration for Duke System”, MS Project Option, Spring 2013, Last known Employment-Duke Energy.
- GP10. R Wertz, “Protection System for Renewable Energy Resource”, MS Project Option, Fall 2013, Last known Employment-Duke Energy.
- GP11. A. Kling, “Power System Communication for Marshal Power Station”, MS Project Option, Fall 2013, Last known Employment-Duke Energy.
- GP12. A Gebrechekos, “Synchrophasor Measurements in Power Grid”, MS Project Option, Fall 2013 Last known Employment-American Electric Power.

#### **Ph.D. Level: 31, M.S. Thesis Level: 16, M.S. Project Level: 12**

Note 1: All the students have successfully joined an industry related to utilities.

Note 1: One student joined the academia

Note 2: 4 Ph.D. students and 4 MS students work for **Duke Energy**.

#### Post-Doctoral Advisees (Direct)

- PG1. K. Murari, “Power Grid modeling and control”, 2019-Current.
- PG2. S. Ghosh, “Wind Farm Integration to Power Grid”, 2014-2016.
- PG3. Y. Baez, “Real-time Energy Resources Models Development and Design” 2014-2016.

#### Committee Memberships (Selected)

- CM1. T. Pan, “Power Electronics Converter”, Ph.D. Candidate, Major Advisor, Dr. Manjrekar.

- CM2. R. Sarup, “Demonstration of OpenFBM Enabled Power System Operations Using Hardware-in-Loop (HIL) Real-Time Simulator”, MS. Thesis, Major Advisor, Dr. Manjrekar.
- CM3. C. Gole, “Analysis of Grid-Connected Inverters”, MS. Thesis, Major Advisor, Dr. Manjrekar.
- CM4. S. Mutha, “Analysis of Negative-Sequence Directional Element for Type-IV wind power plants under various control methodologies”, M.S. Thesis, Major Advisor, Dr. Cecchi.
- CM5. B. Banu, “Power flow management of power distribution system with renewables”, M.S. Candidate, Major Advisor, Dr. Cecchi.
- CM6. J. Wright, “Control of radial electrodynamic wheel vehicle and analysis if axial electrodynamic wheel”, Ph.D. Candidate, Major Advisor, Dr. Jonathan Bird.
- CM7. M Davoudi, “Increasing hosting capacity of the distribution system for an increasingly distributed generation by means of network reconfiguration”, Ph.D. Candidate, Major Advisor, Dr. V. Cecchi
- CM8. B. Poudel, “Frequency-dependent power line modeling”, Major Advisor, Ph.D. Candidate, Dr. V. Cecchi
- CM8. S. Paul, “Three Dimensional Steady-State and Transient Eddy Current Modeling, Ph.D. Spring2014”, Major Advisor, Dr.J. Bird.
- CM9. K.K. Uppalapati, “An investigation into the torque density capabilities of flux-focusing magnetic gearboxes”, Ph.D. Fall 2015, Major Advisor, Dr. J Bird.
- CM10. M. Vedanadam, Design of an Axial Flux Focusing Magnetic Gear, M.S. Thesis, Fall 2013, Major Advisor, Dr. J. Bird.
- CM11. P. Padmanathan, Design of a Continuously Variable Magnetic Gear, M.S Thesis, Fall 2013, Major Advisor, Dr. J. Bird.
- CM12. A. Vaddiraj, “Investigations on Enhanced Powerflow Controller”, M.S. Thesis, Fall 2014, Major Advisor, Dr. Manjrekar.
- CM13. A. Shrestha, “Dynamic remedial action scheme using online transient stability analysis”, M.S. Thesis, Fall 2014, Major Advisor, Dr. Cecchi.
- CM14. V. Sharma, “Deterministic and Probabilistic Forecasting for Wind and Solar Power Using Advance Data Analytics and Machine Learning Technique”, Fall 2018, Major Advisor, Dr. Cali.
- CM15. Ashutosh Deepak Phatak, “Development of a Phasor Measurement Unit for Lowe Voltage Power networks”, M.S. Thesis, Major Advisor, Dr. Noras.
- CM16. Brett Mitchell Cockerham, “Understanding Power System Frequency”, M.S. Thesis, Major Advisor, Dr. Noras.

#### Exchange Scholars (Selected)

- ES1. Jonas Schellhorn, “Modeling and Stability/Control of Weak Power Grid”, April-September 2021.
- ES2. Joanna Geis-Schroer, “Modeling and Stability/Control of Weak Power Grid”, April-September 2019.
- ES3. DeJongh Steven, “Modeling and Optimization of German Power Grid with Renewable Energy Resources”, April-September 2018.
- ES4. Felix hack, “market Analysis of German Power Grid with Integration of Renewables”, April-September 2017.
- ES5. David Freund, “Modeling and HIL framework Demonstration”, April-September 2017.
- ES6. Marlene Gebhard, “Modeling and Real-time simulation of the power grid with renewable energy resources”, April-September 2016.
- ES7. Paul Spies, “Distribution System Optimization with Renewables”, April-September 2016.
- ES8. M. Westermann, “Advance modeling of PV integrated Power grid in Real-Time Digital Simulator” Karlsruhe Institute of Technology, April-September 2015.

- ES9. B. Lang, Advance modeling of power grid based on frequency-dependent network equivalent using Real-Time Digital Simulator” Karlsruhe Institute of Technology, April-September 2015.

External Examiner/Evaluator (Selected)

- E1. Sumit Kumar Jha, Assessment of Demand Side Management For Power Savings in Standalone Microgrid, BITS, Ranchi, India, 2022.
- E2. Sanjeev Kumar Bhalla, “Power Quality Improvements in DFIG Applications for Wind Energy Conversion Systems”, Ph.D., NIT Hamirpur, India, 2015.
- E3. Kiran R Patil, “Impact of Distributed Generations on Stability of Power Systems”, Visvesvaraya Technological University, Karnataka, India, 2021.
- E4. Shubhra Shubhra, “Control of Grid Integrated multiple Solar PV Arrays-battery Based Microgrid system”, IIT Delhi, 2021.
- E5. Vineet P. Chandran, “Standalone and grid-interactive PMSG Based Small Hydro generation with PV and Battery Integration” IIT Delhi, 2021.
- E6. Analysis and Enhancement of Stability of Power Systems with Utility-Scale Photovoltaic Power Plants”, IISc Bangalore, 2021.
- E7. Shivam Chaturvedi, Robust Control Techniques for Virtual Impedance Shaping to Mitigate and Share the Double Line Frequency Ripple in Microgrids, IIT Jodhpur, India, 2021.
- E8. S Madhu Babu, “Investigation on Single-Phase Step-Up Multilevel Inverters for Photovoltaic Standalone Applications”, NIT Warrangal, India, 2021.
- E9. Seema Kanval, “Control of Renewable Energy Based Grid-Interactive Microgrids with Squirrel Cage Induction Generator”, IIT Delhi, India, 2020.
- E10. Priyanka Gangwar, “Multi-Objective Distribution Network Reconfiguration and Optimal Allocation of Renewable Energy Sources”, IIT Kanpur, 2020.
- E11. Bussa Vinod Kumar, “Improved High Gain Converters for Low Power Applications”, IIT BHU, India, 2020.
- E12. Kumari Kasturi, “Smart Integration of Renewable Energy Sources, Energy Storage Systems and Electric Vehicles in Electric Distribution System”, Institute of Technical Education and Research, Odisha, India, 2019.
- E13. Preeti Jain, “Development of Harmonic Phasor Estimation Algorithms and their Application”, Indian Institute of Information Technology Design and Manufacturing, Jabalpur, India, 2019.
- E14. Hadi Lomei, “Emergency Control for Catastrophic Disturbance in Future Power Grids”, University of Wollongong, Australia, 2019.
- E15. M S Suresh, “Planning and Dispatch of Reactive Power for Enhancement of Voltage Stability Using Fuzzy Approach”, VTU, India, 2018.
- E16. Vignesh V, “Improved Load Modelling and Its Impact on Stability of Power Systems Having Large Penetration of Wind Generation”, IIT Kanpur, India, 2016.
- E17. Arvind K Jain, “Development of Strategic Bidding of Supplier and Buyer in Electricity Markets”, Ph.D., IIT Kanpur, India, 2013.
- E18. K. Seethalakshmi, “Development of Adaptive Load Shedding and Distance relaying Scheme utilizing Synchrophasor Technology”, Ph.D., IIT Kanpur, India, 2011.
- E19. P. Tripathy, “Real-Time Power System Stability and Prediction using Synchrophasor Based Wide Area Monitoring System”, Ph.D., IIT Kanpur, India, 2011.
- E20. A. Srinivasan, “A New Method for Identification and Control of Wiener-type nonlinear systems”, Madras University, Ph.D., December 2008.
- E21. MdMuminul chy, “Development and Implementation if Various Speed Controllers for wide Speed Range Operation of PMSM Drive, Lakehead University, Lakehead, CA, M.S., Summer 2007.

Undergraduate Research Level

- UG1. James Haney, “Micro-grid power plant using hybrid renewable energy sources”, Summer 2009.
- UG2. Chad Tanton, “Modeling and Simulation of Solar PV cells”, Summer 2009.

- UG3. Chad Tanton, “High Precision Remote Monitoring and Control of brushless DC Motor”, Spring 2009.
- UG4. Nicholos Feilner “Speed control of brushless DC Motor”, Spring 2009.
- UG5. Jason Augayo, “Sensorless Speed Control of Induction Motor”, Fall 2008.
- UG6. Gerald Swann, “High-Performance Intelligent Controllers for Power System Control”, 2008.
- UG7. Gerald Swann, “Precise temperature controller for Crystal Oscillator”, Spring-Fall 2007. UG8.
- UG8. Chad Witbracht, “Design and development of electric bike” Spring 2007.
- UG9. Chad Currey: “PEM fuel cell modeling and simulation”, Fall 2006.
- UG10. Jonathan Ames “Design and development of Op-Amp based circuits”, Fall 2005.
- UG11. Daniel Lamb “Audio clipping pre-amplifier based on Silicon Control Rectifier”: Summer 2005.

**A. Collaborators (Selected):**

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|-----------------------|---|
| • Adel A. Ghandakly   | California State University, Chico, CA.   |
| • Khalid S. Al-Olimat | Ohio Northern University, Ada, OH.        |
| • Badrul Choudhury    | UNC Charlotte, Charlotte, NC.             |
| • Babak Parkhideh     | UNC Charlotte, Charlotte, NC.             |
| • Robert Cox          | UNC Charlotte, Charlotte, NC.             |
| • Madhav Manjrekar    | UNC Charlotte, Charlotte, NC.             |
| • Teifu Zhao          | UNC Charlotte, Charlotte, NC.             |
| • Tao Han             | UNC Charlotte, Charlotte, NC.             |
| • Johan Enslin,       | Clemson University, Charleston, SC.       |
| • Gerald Swann        | US Navy                                   |
| • Kannan Manickam     | RightScale                                |
| • Kaushal Desai       | SEL Laboratories                          |
| • Tania Orjuela       | University of North Carolina at Charlotte |
| • Gayatri Deshpande   | TDK Corporation                           |
| • Nikhil Kulkarni     | Rolls Royce                               |
| • R Buyyanapragada    | Ecojiva                                   |
| • Tim George Paul     | SEL Laboratories                          |
| • Paras Mandal        | University of Texas at El Paso            |
| • Anurag Srivastava   | Washington State University               |
| • Sumit Paudyal       | Michigan Technological University         |
| • Bishnu Bhattarai    | Pacific North West National Lab           |
| • Kurt Myers          | Idaho National Lab                        |
| • Jake Gentle         | Idaho National Lab                        |
| • Manish Mohanpurkar  | Idaho National Lab                        |
| • Jeremy Lin          | PJM Interconnection LLC                   |
| • Rao Kunidana        | MidWest ISO                               |
| • Shawn Rampy         | Storm Geo                                 |
| • Laura Brown         | Michigan Technological University         |
| • Sarwat, Arif        | Florida International University          |
| • Miguel veles-Reyes  | University of Texas at El Paso            |
| • Saroj Biswas        | Temple University                         |
| • Steve Stephel       | PEPCO Holdings                            |
| • Sichitiu, Mihail    | North Carolina State University           |
| • Lu, Ning            | North Carolina State University           |
| • Cali, Umit          | University of North Carolina at Charlotte |
| • Demir, Ibrahim      | University of Iowa                        |
| • Ismail Guvenc       | North Carolina State University           |
| • Mo-Yen- Chow        | North Carolina State University           |
| • Swarup, Samarth     | Virginia Tech                             |

- Dou, Wenwen                      University of North Carolina at Charlotte
- Saad, Walid                      Virginia Tech
- Joydeep Mitra                    Michigan State University
- Ali Mehrzi Sani                  Washington State University
- Anurag K. Srivastava           Washington State University
- Valentina Cecchi                University of North Carolina at Charlotte
- Joha Enslin                      Clemson University
- Reza Ghorbani                  University of Hawaii
- Arun Ravindran                  University of North Carolina at Charlotte
- S Ghosh                          University of North Carolina at Charlotte
- Yamilka Baez                    University of North Carolina at Charlotte
- Kashem Muttaqi                University of Wollongong
- Sharath Parera                  University of Wollongong
- Nishad Mendis                  Alstom Grid
- Ehab El-Shaer                  University of North Carolina at Charlotte

Other Professional Preparations and Skills (Selected):

- **Technical Expertise**

High-Level Languages: C, C++, Java, HTML, FORTRAN, PASCAL, and LISP. Assembly Level Languages: Intel 8085, Motorola 68HC11, 68HC12

Applications/Packages/Tools: MATLAB, SIMULINK, PSPICE, DAve, PHYTEC, MICROSIM, MICROVISION, ORCAD, PSS/E, PST V1.1, Z8, Zilog, PSCAD/EMTP, Dspace.

Mathematical Techniques: Optimization, Simplex Routines, Power Flow, Economic Dispatch, Nonlinear Systems modeling, Digital and Adaptive Control, Neural Network, Fuzzy Logic, and ANN Techniques.

- **Research Skills and developed Algorithms (selected)**

Power: Fast Decoupled Load Flow, Voltage stability assessment and improvement algorithms, ANN-based Voltage Stability Analysis, Economic Dispatch, Synchronous, Induction and DC Machine Model and Control, Adaptive control for Synchronous Generator operation, State Estimation, Short Circuit Studies, other Power System modeling, and real-time simulations.

Control: Self Tuning Regulator, Direct MRAC, Intelligent Adaptive Control based on Fuzzy Systems and Neural Network, Optimal Control, Time-domain techniques, Direct and Indirect Method of Digital Control, Graphical User Interface (GUI) for Intelligent Adaptive Control Algorithms.

Computational Intelligence: Growing radial basis dynamic neural network, Feedforward neural network with LM technique, Fuzzy logic switching scheme, Heuristic-based game playing theory.

Embedded Systems and Micro Controllers: Control logic algorithms for DC Motor Speed Control, Algorithms for peripheral device usage and CAN communication using C 505C. Assembly Language codes in Motorola 68HC12 for various projects, interface knowledge using TMS 320CDSP, and Zilog Z8.