Sowmya Acharya

Research Associate
Department of ECE, UW-Madison

+1 (919) 744 1679
sacharya2@wisc.edu
acharya-sowmya.github.io

Research Interests

My current work focuses on efficient compression of large datasets obtained from phasor measurement units. Optimization of power system operations, and processing of real-time measurement data for analysis and control applications are my primary research interests.

Education

Dec 2019 **Ph.D. in Electrical Engineering**, *University of Wisconsin - Madison, WI*
Advisor: Dr. C. L. DeMarco
GPA: 3.93/4.00

Aug 2014 **M.S. in Electrical Engineering**, *University of Wisconsin - Madison, WI*
GPA: 3.90/4.00

May 2012 **B.Tech. in Electrical Engineering**, *Veermata Jijabai Technological Institute, India*
GPA: 9.00/10.00

Experience

Research

2020–present **Research Associate** *University of Wisconsin-Madison*
Software development and testing, in the field of data analytics for power grid measurement data. Collaborate on EPIGRIDS project for developing metrics to validate synthetic grids.

2014–2019 **Research Assistant** *University of Wisconsin-Madison*
Compression algorithms for PMU data by adapting image and video compression techniques and exploiting the spatial and temporal correlations in the measurements.

2012–2014 **Master's Research** *University of Wisconsin-Madison*
Near real-time identification of power line outages through dynamic control of power systems and observer design.

Teaching

2012–2013 **Teaching Assistant** *University of Wisconsin-Madison*
Math 114: Algebra and Trigonometry (Fall '12, Fall '13)
Math 320: Linear Algebra and Differential Equations (Spring '13)

Professional Experience

Aug–Dec 2018 **Fellow Intern** *GE Global Research*
Evaluated and refined a cyberattack detection algorithm to detect and characterize replay attacks on wide area measurement system (WAMS) data. Contributed to parameter tuning and validation of composite load models for simulating fault-induced delayed voltage recovery.

Publications

Journal *Sowmya Acharya and C. L. DeMarco,* "Low-loss Image-based Compression for Synchrophasor Measurements". [*Under review in IEEE Transactions on Smart Grid*]

Conference *Sowmya Acharya and C. L. DeMarco,* "Enhancing Lossy Compression of PMU Measurements by Data Conditioning", ISGT North America 2020 [*Accepted*]

Conference *Philip Hart, Sowmya Acharya and Honggang Wang,* "Coherency-Based Detection Algorithm for Synchrophasor Cyberattacks", North American Power Symposium (NAPS 2019).

Conference *Sowmya Acharya and C. L. DeMarco,* "Exploiting Network-induced Correlation for Efficient Compression of PMU Data", North American Power Symposium (NAPS 2018).

Report *Sankar, Lalitha, Christopher DeMarco, Reetam Sen Biswas, Zhigang Chu, Andrea Pinceti, Sowmya Acharya, and Jong Min Lim,* "Synchrophasor Data-Analytics for a More Resilient Electric Power System," Power Systems Engineering Research Center, Final Project Report S-74, September 2019.

Poster *Sowmya Acharya and C. L. DeMarco,* "Topology Error Estimation in Power System Dynamic Models", IEEE PES T&D Conference and Exposition 2018.

Relevant Coursework

Advanced Power Systems Analysis, Linear Programming Techniques, Nonlinear Optimization, Optimal Control and Variational Methods, Online Control of Power Systems

Professional Development

Jun 2014 *Short Course:* Power System Operation in the Age of Smart Grid

Jun 2013 *Short Course:* Smart Grid Applications of WAMS

Professional Skills

MATLAB/Simulink, PowerWorld, Python, LaTeX

Leadership Positions

Member Graduate student representative to the *Committee on Women in the University* at the UW-Madison (2016 – 2019)

Member Appointed member of Shared Governance Committee in the Associated Students of Madison (2016 – 2019)

Mentor Mentoring undergraduate students in the ECE department of UW-Madison who are recipients of the *Reynolds Scholarship* (2016 – 2017)

Volunteer Actively helping with various events organized by the Carbone Cancer Center at the UW-Hospital