

EDUCATION

- Texas A&M University**, College Station, Texas *Aug. 2017 – Aug. 2021 (expected)*
Doctor of Philosophy in Electrical and Computer Engineering
Thesis: Physical and Cyber Anomaly Management in Massively Digitized Power Systems
- MIT**, Cambridge, Massachusetts *Sep. - Dec. 2018*
Long-term visiting Ph.D. student at MIT Laboratory of Information & Decision Systems (MIT LIDS)
- Texas A&M University**, College Station, Texas *Aug. 2014 – May 2017*
Master of Science in Electric Power
Thesis: Prioritization of PMU Location and Signal Selection for Monitoring Critical Power System Oscillations
- North China Electric Power University**, China *Sep. 2009 - Jul. 2013*
Bachelor of Engineering in Electric Power Engineering and its Automation

PROFESSIONAL EXPERIENCE

- Texas A&M University**, College Station TX *Sep. 2017 – now*
Research Assistant
Instructor for Application of Data Science in Modern Power Systems *Jan.- May. 2020*
Teaching Assistant for Application of Data Science in Modern Power Systems *Sep. - Dec. 2017*
Research Group Secretary *Sep. 2017 – Dec. 2019*
- Mitsubishi Electric Research Laboratories**, Cambridge, MA *May 2019 – Aug. 2019*
Intern Researcher at Data Analytics group
- Developed a framework for parameter coordination of interconnected microgrids against disasters
 - Drafted a conference paper and a patent
- ISO New England**, Holyoke, MA *Jan. 2018 – May 2018*
Intern Researcher at the department of Business Architecture Technology
- Developed PCM-TSAT adaptor prototype for studying cascading failure from transient simulation viewpoint
 - Developed Sensitivity Analysis Tool for Vermont model improvement (PowerWorld + SimAuto + Matlab)

JOURNAL PUBLICATIONS

- [J4] **T. Huang**, S. Gao, and L. Xie, "Transient Stability Assessment of Networked Microgrids Using Neural Lyapunov Methods," submitted to *IEEE Transactions on Smart Grid*.
- [J3] **T. Huang**, N. M. Freris, P. R. Kumar and L. Xie, "A Synchrophasor Data-Driven Method for Forced Oscillation Localization Under Resonance Conditions," in *IEEE Transactions on Power Systems*, vol. 35, no. 5, pp. 3927-3939, Sept. 2020
- [J2] **T. Huang**, B. Satchidanandan, P. R. Kumar and L. Xie, "An Online Detection Framework for Cyber Attacks on Automatic Generation Control," in *IEEE Transactions on Power Systems*, vol. 33, no. 6, pp. 6816-6827, Nov. 2018.

[J1] **T. Huang**, M. Wu and L. Xie, "Prioritization of PMU Location and Signal Selection for Monitoring Critical Power System Oscillations," in *IEEE Transactions on Power Systems*, vol. 33, no. 4, pp. 3919-3929, July 2018.

CONFERENCE PUBLICATIONS

[C6] **T. Huang**, H. Sun, K. Kim, D. Nikovski, and L. Xie, "A holistic framework for parameter coordination of interconnected microgrids against disasters," *IEEE PES General Meeting* 2020. (**Best Paper Award**)

[C5] **T. Huang**, S. Gao, X. Long, and L. Xie, "A Neural Lyapunov Approach to Transient Stability Assessment in Interconnected Microgrids," in *54-th Hawaii International Conference on System Sciences (HICSS 54)*, 2021. (**Best Paper Award**)

[C4] **T. Huang**, B. Wang, J. Ramos-Ruiz, P. Enjeti, P. R. Kumar, and L. Xie, "Detection of Cyber Attacks in Renewable-rich Microgrids Using Dynamic Watermarking," *IEEE PES General Meeting* 2020.

[C3] W. Li, **T. Huang**, N. Freris, P. Kumar, and L. Xie "Data-driven Localization of Forced Oscillations in Power Systems," in *IEEE PES Innovative Smart Grid Technologies Asia (ISGT Asia)*, 2019.

[C2] **T. Huang**, N. M. Freris, P. R. Kumar, and L. Xie, "Localization of forced oscillations in the power grid under resonance conditions," *52nd Annual Conference on Information Sciences and Systems (CISS)*, Princeton, NJ, 2018, pp. 1-5.

[C1] M. S. Modarresi, **T. Huang**, H. Ming, and L. Xie, "Robust Phase Detection in Distribution Systems," *2017 IEEE Texas Power and Energy Conference (TPEC)*, College Station, TX, 2017, pp. 1-5.

PROPOSAL EXPERIENCE

Secure Monitoring and Control of Solar Power Distribution System Through Dynamic Watermarking

May – Nov. 2019

- Drafted part of concept paper and part of technical volume
- Drafted a response letter for reviewers' comments and slides for a pre-selection clarification interview
- Result: **\$4.4 million** grant from the Department of Energy

HONORS AND AWARDS

Best Paper Award, 54-th Hawaii International Conference on System Sciences (HICSS 54), 2021

Best Paper Award, IEEE Power & Energy Society General Meeting, 2020

Graduate Teaching Fellowship, Texas A&M University, 2020

Thomas W. Powell '62 and Powell Industries Inc. Fellowship, Department of ECE, Texas A&M University

PRESS COVERAGE

"HICSS-54 Best Paper Award – Tong et al., 2021"

Texas A&M Engineering Experiment Station Smart Grid Center News, Jan. 2021

"Research team receives best paper award at flagship IEEE conference"

Texas A&M University Engineering News, Sept. 2020

“2020 IEEE PES Best Paper Award”

Texas A&M Engineering Experiment Station Smart Grid Center News, Aug. 2020

“Best conference paper of IEEE PES-GM 2020”

Mitsubishi Electric Research Laboratories (MERL) News & Events, June, 2020

“Cybersecurity and solar energy: How are they related?”

Texas A&M University Engineering News, Jan. 2020

“Researchers receive \$4.4M Department of Energy grant to enhance solar technology”

Texas A&M Engineering Experiment Station News, Sept. 2019

TEACHING EXPERIENCE

Texas A&M University

Jan. – May 2020

Instructor for ECEN489/689 Application of Data Science in Modern Power Systems

- Provided lectures; developed course materials; mentored students for research projects

Texas A&M University

Sep. – Dec. 2017

Teaching Assistant for ECEN689 Application of Data Science in Modern Power Systems

- Designed homework/quiz/exam; provided tutorials; graded homework/quiz/exam

RESEARCH PROJECTS

Secure Monitoring and Control of Solar Power Distribution System Through Dynamic Watermarking

July. 2020 - now

- Identified microgrid model and designed cyberattack detector via Dynamic Watermarking technique
- Wrote quarterly reports and made slides for quarterly review

Synchrophasor Analytics for ERCOT

Jun. 2019 – Jun. 2020

- Determined critical oscillatory modes from both ambient and ringdown synchrophasor data offered by ERCOT
- Pinpointed forced oscillation sources in ERCOT events using robust PCA

Localization of Forced Oscillations in the Power Grid

Dec.2017 – Sept. 2019

- Developed a purely data-driven approach to pinpoint the source of forced oscillations in power systems
- Finding theoretical justification of the proposed method based on RPCA

An Online Defense Framework against Cyber Attacks on Automatic Generation Control

Jan. – Nov.2017

- Introduced a first-of-its-kind online defense framework against false data injection attacks on AGC

Prioritization of PMU Location and Signal Selection for Monitoring Critical Oscillations

Aug. – Dec.2016

- Established a robust mapping from modes of interest to PMUs' location in terms of stochastic disturbance
- Derived close-form formulas for angle difference and amplitude ratio and tested them via PSS/E simulation

Robust Phase Detection Approach in Distribution Systems

Sep. - Dec. 2016

- Formulated covariance matrix based on estimated data and implemented phase detection in distribution system

PROFESSIONAL ACTIVITIES

Session Chair, IEEE Power & Energy Society (PES) General Meeting 2020

Committee Member, IEEE Texas Power and Energy Conference (TPEC) 2019

Webinar Coordinator, MIT A+B 2020

Virtual Meeting Coordinator, IEEE Power & Energy Society (PES) Women in Power (2020 – now)

Journal Reviewer: IEEE Transactions on Power Systems, IEEE Transactions on Smart Grids, IEEE Transactions on Industry Applications, IEEE Internet of Things Journal, IEEE Industry Applications Magazine, IEEE Power Engineering Letters, International Journal of Electrical Power & Energy Systems, Energy Systems

Conference Reviewer: IEEE PES General Meeting 2018-2020, Power System Computation Conference (PSCC 2018), Texas Power and Energy Conference (TPEC 2018), Annual Conference of the IEEE Industrial Electronics Society (IECON 2020)

PRESENTATIONS & INVITED TALKS

[P9] “A Neural Lyapunov Approach to Transient Stability Assessment in Interconnected Microgrids”
54-th Hawaii International Conference on System Sciences (HICSS 54), 2021, paper presentation
HICSS-54 Energy Systems Track Virtual Session, poster presentation

[P8] “Forced Oscillation Localization in ERCOT System through Synchrophasors”
The North American Synchrophasor Initiative (NASPI) Work Group Meeting, Nov. 3, 2020

[P7] “Tutorial of Forced Oscillation Localization Tool”
Electric Reliability Council of Texas (ERCOT), Aug. 12, 2020

[P6] “Detection of Cyber Attacks in Renewable-rich Microgrids Using Dynamic Watermarking”
IEEE Power & Energy Society (PES) General Meeting, Aug. 5, 2020

[P5] “A Holistic Framework for Parameter Coordination of Interconnected Microgrids against Disasters”
IEEE Power & Energy Society (PES) General Meeting, Aug. 3, 2020

[P4] “Robust PCA over Dynamic Systems: A Case of Forced Oscillation Localization”
LIDS & Stats Tea Talk, Laboratory of Information & Decision Systems
Massachusetts Institute of Technology (MIT), Nov. 7, 2018

[P3] “PMU Prioritization and Forced Oscillation Localization in Power Systems”
ISO New England, Sep. 13, 2018

[P2] “An Online Defense Framework against Cyber Attacks on Automatic Generation Control”
ISO New England, Feb. 2018

[P1] “Prioritization of PMU Location and Signal Selection for Monitoring Critical Oscillations”
IEEE Power & Energy Society (PES) General Meeting, Aug. 4, 2020
Electric Reliability Council of Texas (ERCOT), Nov. 17, 2017
Shenzhen Research Institute of Big Data, The Chinese University of Hong Kong (Shenzhen), Aug. 17, 2017

SKILLS

Software: PSS/E, MATLAB, Simulink, Python, PowerWorld, SimAuto, TSAT, LaTeX, Microsoft Office, Visio
Certification: Engineer-in-Training (EIT)