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Yao Xie (she/her/hers)

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Education

Ph.D. in Electrical Engineering (minor in Mathematics), *Stanford University*, January 2012.
Advisors: David Siegmund and Andrea Goldsmith.
Thesis: "Statistical signal detection with multi-sensor and sparsity."
M.Sc. in Electrical and Computer Engineering, *University of Florida*, August 2006.
B.Sc. in Electrical Engineering and Information Science, *University of Science and Technology of China (USTC)*, July 2004. (*Best Undergraduate Thesis Award*.)

Academic Appointments and Leadership

Georgia Institute of Technology, Atlanta, GA
Professor and Coca-Cola Foundation Chair (2023 – present)
Associate Director, Machine Learning Center (2020 – present)
Associate Professor (2019 – 2023); Assistant Professor (2013 —2019)
Harold R. and Mary Anne Nash Early Career Professorship (2017—2023)
Adjunct Professor, School of Electrical and Computer Engineering (ECE) (2018–present)
Duke University, Durham, NC. Postdoctoral Research Scientist, ECE (2011–2013)
General Electric Global Research Center. Research Intern, Medical Imaging Lab. (2007).

Honors and Awards (selected)

Fellow, Executive Leadership in Academic Technology, Engineering, and Science (ELATES) Program, 2025-2026 cohort.
CWS Woodroofe Award, 2024.
Citation: "Renowned for her innovative methods in statistical learning, Yao has made significant strides in sequential analysis and change-point detection. Her work tackles real-world challenges by developing advanced algorithms for big data problems, including sparse changes in high-dimensional data and spatio-temporal modeling. Notably, her methods have been applied to enhance crime data analysis and optimize police zone designs, demonstrating profound societal impact. Yao's research combines rigorous statistical theory with practical applications, making her a standout in the field of statistics and data science."
INFORMS Gaver Early Career Award for Excellence in Operations Research, 2022.
Citation: "For outstanding research contributions at the interface of operations research, statistics, machine learning, and optimization; for successfully applying her research talent to applications of societal importance; and for contributions to the education and mentoring of students at all levels." Given to one recipient annually across INFORMS society.
Georgia Tech ISyE DEI Fellow, 2022.
INFORMS Wagner Prize (1 of 4 Finalists), 2021.
Georgia Tech Emerging Leaders Program, 2020.
Smart 50 Award at the Smart Cities Connect Conference and Expo, 2018.
National Science Foundation (NSF) CAREER Award, 2017.
Class of 1969 Teaching Fellow, Georgia Tech, 2015.

Impact Highlights and Selected Grants

• Atlanta Police Department beat redesigns (2019; 2025 neighborhood-integrity redesign): City council approved and implemented, shaping deployment for nearly six million residents; recognized with the *Smart 50 Award*; broad media coverage. Funded by Atlanta Police Foundation.

• National Science Foundation (NSF) Mathematical Foundation of Deep Learning (MoDL) program (Lead PI, 2021–2025, $1.1M): national, multi-institution effort on mathematical foundations of hypothesis testing with deep learning.
• NSF CAREER (PI, 2017-2022) Quick detection for streaming data over dynamic networks (PI).
• NSF, Algorithm for Threat Detection (ATD) program (PI, 2023-2026, 2018-2021), Algorithm for Modern Power Systems (AMPS) program (PI, 2019-2022)

Editorial and Community Leadership

• Associate Editor for 6 leading journals including *Operations Research, IEEE Transactions on Information Theory, Journal of the American Statistical Association, Theory and Methods (JASA-T&M), Annals of Applied Statistics*, *Technometrics, IEEE Transactions on Signal Processing*, *INFORMS Journal on Data Science*,
Sequential Analysis.
• Area Chair, NeurIPS 2021-2025, ICML 2023-2025, ICLR 2024. Senior PC, AAAI 2025.

Keynotes/Plenaries/Tutorials: KDD Workshops (2025); International Workshop on Sequential Methods (IWSM) (Plenary, 2024); International Symposium on Information Theory (ISIT) and International Conference on Acoustics, Speech, and Signal Processing (ICASSP) (tutorials on generative models, 2024); INFORMS Data Mining and Decision Analytics (DMDA) (Plenary, 2024).

Research Themes & Contributions: My work advances high-dimensional statistical inference and robust machine learning, with an impact on critical societal applications.
• High-dimensional sequential inference and change-point detection: theory and methods for rapid detection of abrupt shifts in multi-sensor, network, and high-dimensional data settings.
• Conformal prediction for time series: rigorous uncertainty quantification for modern ML models; algorithms adopted in MAPIE and AWS Fortuna.
• Spatio-temporal point processes: deep learning and statistical models for crime, traffic, COVID-19, and clinical ICU patients' data.
• Trustworthy AI foundations: distributionally robust optimization theory and methods for robust learning, and flow-based generative models in Wasserstein space.

Selected Publications

• Cheng, Lu, Tan, XIE. "Convergence of flow-based generative models via proximal gradient descent in Wasserstein space." IEEE TRANSACTIONS ON INFORMATION THEORY, 2024.
• Wang, Gao, XIE. "Sinkhorn distributionally robust optimization." OPERATIONS RESEARCH, 2025.
• Xu, XIE. "Conformal prediction for time-series." IEEE TRANSACTIONS ON PATTERN RECOGNITION AND MACHINE INTELLIGENCE (TPAMI), 2023; ICML 2021 (Long); ICML 2023; ICML 2024 (Spotlight).
• Zhu, XIE. "Crime linkage detection by spatial-temporal-textual point processes." ANNALS OF APPLIED STATISTICS, 2022.
• L. Xie, Moustakides, XIE. "Window-limited CUSUM for sequential change detection." IEEE TRANSACTIONS ON INFORMATION THEORY, 2023.
• XIE, Siegmund. "Sequential multi-sensor change-point detection." ANNALS OF STATISTICS, 2013.

Teaching & Mentoring Highlight

• Known for developing popular courses with high evaluations, including ISyE/OMSA 6740 "Introduction to Machine Learning": (1,000+ learners annually).
• Graduated 17 Ph.D. students; academic placements as Assistant Professors at CMU, Univ. Minnesota, Chinese University of Hong Kong, national labs, and industry research positions.
• Co-organized NSF Foundations of Data Science Summer School (2019); contributor to Mission Possible Summer Camp at Georgia Tech.