Vincent Y. F. Tan

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Research Interests

Information Theory, Statistical Signal Processing, Machine Learning

Education

Massachusetts Institute of Technology
Ph.D. in Electrical Engineering and Computer Science, February 2011
Thesis topic: Large-Deviations Analysis and Applications of Learning Tree-Structured Graphical Models (Jin-Au Kong Outstanding Thesis Prize)

Cambridge University
B.A. (Class 1), M.Eng. (Distinction) in Electrical and Information Sciences, July 2005
Thesis topic: Blind Audio Source Separation (Charles Lamb Prize)

Professional Experiences

Professor, Dept. of Mathematics and Dept. of Electrical and Computer Engineering (ECE), National University of Singapore (NUS)
Jul 2023 - present. Teaching classes, advising graduate students, internal service

Dean's Chair Associate Professor, Dept. of Electrical and Computer Engineering (ECE) and Dept. of Mathematics, National University of Singapore (NUS)
Jan 2018 - Jun 2023. Teaching classes, advising graduate students, internal service

Assistant Professor, Dept. of Electrical and Computer Engineering (ECE) and Dept. of Mathematics, NUS
Jan 2014 - Dec 2017. Teaching classes and advising graduate students

Scientist, Data Analytics Dept., Institute for Infocomm Research (I^2R), Agency for Science, Technology and Research (A*STAR), Singapore
Feb 2012 - Dec 2013. Designing algorithms for analyzing high-dimensional data

Post-Doctoral Researcher, Dept. of ECE, University of Wisconsin-Madison
Dec 2010 - Oct 2011. Worked with Prof. Stark Draper on information theoretic security, machine learning and coding theory

Significant Grants

2022: Ministry of Education Tier 2 Grant "Learning Latent Structure of High-Dimensional Data with Adversarial Training" (SGD $476,000$)
2021: DESCARTES: A CREATE Program on AI-based Decision making in Critical Urban Systems, Workpackage 3: Optimization-Driven Hybrid AI (SGD $3,600,000$)
2018: National Research Foundation (NRF) Fellowship "Fundamental Limits for Statistical Learning Algorithms" (SGD $2,060,000$)
2017: Ministry of Education Tier 2 Grant "Nonnegative Matrix Factorization: Geometry, Privacy and Statistical Lower Bounds" (SGD $450,000$)
2015: Ministry of Education Tier 2 Grant "Network Communication with Synchronization Errors: Fundamental Limits and Codes" (SGD $500,000$)
2014: NUS Young Investigator Award for the project "An Information-Theoretic Understanding of Machine Learning Algorithms" (SGD $500,000$)

Recent Research Awards

2023: Faculty of Science Award in Mentorship Excellence (Research Category)
2022: Reappointed to a Dean's Chair Associate Professorship (College of Design and Engineering)
2019: Appointed to a Dean's Chair Associate Professorship (Faculty of Engineering)
2019: NUS Young Researcher Award
2018/9: Distinguished Lecturer (DL) of the IEEE Information Theory Society

2018: NUS Faculty of Engineering Young Researcher Award
2018: Singapore National Research Foundation (NRF) Fellowship (Class of 2018)

Recent Teaching Awards

2020/21: Annual Teaching Excellence Award (University level)
2020/21: Engineering Educator Award
2019/20: Engineering Educator Award

Teaching Experiences

EE2012, *Analytical Methods in Electrical and Computer Engineering* (2 times)
EE2211, *Introduction to Machine Learning* (1 time)
EE5137, *Stochastic Processes* (5 times)
EE5138, *Optimization for Communication Systems* (1 time)
EE5139, *Information Theory for Communication Systems* (5 times)
MA3110, *Mathematical Analysis II* (1 time)
MA4261, *Information and Coding Theory* (1 time)
DSA3102, *Essential Data Analytics Tools: Convex Optimisation* (1 time)
MA4270, *Data Modeling and Computation* (5 times)
MA6241, *Bandit Algorithms* (1 time)

Recent Publications

1. "Optimal Clustering with Bandit Feedback", Junwen Yang, Zixin Zhong and Vincent Y. F. Tan, JMLR, 2024

2. "Almost Minimax Optimal Best Arm Identification in Piecewise Stationary Linear Bandits" Yunlong Hou, Vincent Y. F. Tan, and Zixin Zhong, NeurIPS, 2024

3. "Influence Maximization via Graph Neural Bandits", Yuting Feng, Vincent Y. F. Tan, and Bogdan Cautis, SIGKDD, 2024

4. "Fixed-Budget Differentially Private Best Arm Identification", Zhirui Chen, P. N. Karthik, Yeow Meng Chee, and Vincent Y. F. Tan, ICLR, 2024

5. "Probably Anytime-Safe Stochastic Combinatorial Semi-Bandits", Yunlong Hou, Vincent Y. F. Tan, and Zixin Zhong, ICML, 2023

6. "Communication-Constrained Bandits under Additive Gaussian Noise", Prathamesh Mayekar, Jonathan Scarlett, and Vincent Y. F. Tan, ICML, 2023

7. "Almost Cost-Free Communication in Federated Best Arm Identification", Kota Srinivas Reddy, P. N. Karthik, and Vincent Y. F. Tan, AAAI, 2023

8. "Minimax Optimal Fixed-Budget Best Arm Identification in Linear Bandits", Junwen Yang and Vincent Y. F. Tan, NeurIPS, 2022

9. "A Unifying Theory of Thompson Sampling for Continuous Risk-Averse Bandits", Joel Q. L. Chang and Vincent Y. F. Tan, AAAI, 2022

10. "Probabilistic Sequential Shrinking: A Best Arm Identification Algorithm for Stochastic Bandits with Corruptions", Zixin Zhong, Wang Chi Cheung, and Vincent Y. F. Tan, ICML, 2021

Selected Professional Activities

2024–present: Technical Program Committee (TPC) Co-chair of the 2025 IEEE International Symposium on Information Theory (ISIT)
2024–present: Action Editor of *Transactions on Machine Learning Research*
2023–present: Area Chair of ICLR and NeurIPS
2022–present: Senior Area Editor, *IEEE Transactions on Signal Processing*
2021–present: Elected Member of the Information Theory Society Board of Governors
2020–present: Associate Editor in Machine Learning and Statistics, *IEEE Transactions on Information Theory*

Selected NUS Internal Service

2024–present: Member of the University Promotion and Tenure Committee (UPTC)
2020–2022: Chair of the University Midterm Advisory Report (MTAR) Committee for STEM Disciplines
2010–2020: Member of the University Midterm Advisory Report (MTAR) Committee for STEM Disciplines
2018–2022: Member of the Faculty (of Engineering) Promotion and Tenure Committee (FPTC)