

Chee Wei Tan

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- EDUCATION ♦ Princeton University, Princeton, NJ
M.A. 2006, Ph.D. in Electrical Engineering 2008.
- ♦ National University of Singapore
B.S. in Electrical Engineering (First Class Honors) 2002.
- APPOINTMENT ♦ Associate Professor, College of Computing and Data Science, Nanyang Technological University, Singapore, 2022-present
- ♦ Associate Professor, Department of Computer Science, City University of Hong Kong, 2010-2021
- ♦ Visiting Faculty, Tencent AI Lab, 2018
- ♦ Visiting Faculty, Qualcomm R&D (QRC), California 2011
- ♦ Postdoctoral Scholar, Department of Computing and Mathematical Sciences, California Institute of Technology, Pasadena, California 2008-2009
- RESEARCH ♦ Generative AI and Large Language Models
- EXPERTISE ♦ Distributed Optimization
- ♦ Wireless and Social Networking
- AWARDS AND HONOR ♦ Honorable Mention Paper Award in Foundation Models and Generative AI, IEEE Conference on Artificial Intelligence, 2024
- ♦ Distinguished Lecturer of IEEE Communications Society (2020-2023)
- ♦ Teaching Excellence Award of City University of Hong Kong 2021
- ♦ Senior Fellowship at Institute for Pure and Applied Mathematics (IPAM) for Program on Science at Extreme Scales 2018
- ♦ Google Faculty Award 2019
- ♦ Selected Participant, U.S. National Academy of Engineering China-America Frontiers of Engineering (CAFOE) Symposium, 2013 and 2015
- ♦ IEEE Communications Society Outstanding Young Researcher Award
- ♦ Princeton University Wu Prize for Excellence
- RECENT PUBLICATION ♦ L. Chen, D. Zhao, L. Tao, K. Wang, S. Qian, X. Zeng and C. W. Tan, A Credible and Fair Federated Learning Framework Based on Blockchain, IEEE Transactions on Artificial Intelligence, 2024.
- ♦ Y. Jiang, J. Shen, Z. Liu, C. W. Tan, K.-Y. Lam, Towards Efficient and Certified Recovery from Poisoning Attacks in Federated Learning, IEEE Transactions on Information Forensics & Security, 2024.
- ♦ Md T. R. Laskar, S. Alqahtani, M. S. Bari, M. Rahman, M. A. M. Khan, H. Khan, I. Jahan, Md A. H. Bhuiyan, C. W. Tan, Md R. Parvez, E. Hoque, S. Joty and X. Huang, A Systematic Survey and Critical Review on Evaluating Large Language Models: Challenges, Limitations, and Recommendations, The 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP), 2024.

- ◇ Y. Zhang, T. Gao, C. Li and C. W. Tan, Coded Federated Learning for Communication-Efficient Edge Computing: A Survey, *IEEE Open Journal of the Communications Society*, Vol. 5, pp. 4098-4124, 2024.
- ◇ L. Tao, Y. Lu, Y. Fan, L. Shi, C. W. Tan, Z. Wei, Throughput-Scalable Shard Reorganization Tailored to Node Relations in Sharding Blockchain Networks, *IEEE Transactions on Computational Social Systems*, 2024.
- ◇ S. Chen, C. W. Tan, X. Zhai and H. V. Poor, OpenRANet: Neuralized Spectrum Access by Joint Subcarrier and Power Allocation with Optimization-based Deep Learning, *IEEE Transactions on Green Communications and Networking*, 2024.
- ◇ L. Chen, W. Zhang, C. Dong, D. Zhao, X. Zeng, S. Qiao, Y. Zhu, C. W. Tan, FedTKD: A Trustworthy Heterogeneous Federated Learning Based on Adaptive Knowledge Distillation, *Entropy*, 26(1), 96, 2024.
- ◇ L. Chen, W. Zhang, C. Dong, Z. Huang, Y. Nie, Z. Hou, S. Qiao, C. W. Tan, FedDRL: Trustworthy Federated Learning Model Fusion Method Based on Staged Reinforcement Learning, *Computing and Informatics*, 43(1): pp. 1-37, 2024.
- ◇ D. T. K. Ng, C. W. Tan, J. K. L. Leung, Empowering Student Self-regulated Learning and Science Education through ChatGPT: A Pioneering Pilot Study, *British Journal of Educational Technology*, Vol. 55, Issue 4, pp. 1328-1353, 2024.
- ◇ C. N. Hang, P. D. Yu and C. W. Tan, MCQGen: A Large Language Model-Driven MCQ Generator for Personalized Learning, *IEEE Access*, Vol. 12, pp. 102261-102273, 2024.
- ◇ M. Wong and C. W. Tan, Aligning Crowd-sourced Human Feedback for Code Generation with Bayesian Inference, *IEEE Conference on Artificial Intelligence*, 2024
- ◇ P. D. Yu, C. W. Tan, L. Zheng and C. Zhao, Unraveling Contagion Origins: Optimal Estimation through Maximum-Likelihood and Starlike Graph Approximation in Markovian Spreading Models, under review, 2024.
- ◇ C. W. Tan, Large Language Model-Driven Classroom Flipping: Empowering Student-Centric Peer Questioning with Flipped Interaction, *IEEE CAI AI for Education Workshop*, CoRR abs/2311.14708, 2024
- ◇ P.-D. Yu, L. Zheng and C. W. Tan, Contagion Source Detection by Maximum Likelihood Estimation and Starlike Graph Approximation, 58th Conference on Information Sciences and Systems (CISS), 2024.
- ◇ S. Chen and C. W. Tan, Neural Sum Rate Maximization for AI-Native Wireless Networks: Alternating Direction Method of Multipliers Framework and Algorithm Unrolling, *ACM MobiSys 2024 International Workshop on Networked AI Systems*, 2024.
- ◇ H. Liang, Z. Zhan, W. Liu, X. Zhang, C. W. Tan and X. Chen, FedReMa: Improving Personalized Federated Learning via Leveraging the Most Relevant Clients, 27th European Conference on Artificial Intelligence, 2024.
- ◇ T. Gao, J. Lin, C. Li and C. W. Tan, Federated Learning Meets Network Coding: Efficient Coded Hierarchical Federated Learning, *IEEE Information Theory Workshop*, 2024.
- ◇ Y. Jiang, C. W. Tan and K.-Y. Lam, Accelerating Federated Unlearning via Polyak Heavy Ball Method, *IEEE Information Theory Workshop*, 2024.
- ◇ C. Zhao, Z. Wang, Q. Zhou, C. W. Tan and C. Chan, Infodemic Source Detection: Enhanced Formulations with Information Flow, *IEEE International Symposium on Information Theory (ISIT)*, 2024.
- ◇ S. Fu, X. Zhai, C. Yi, L. Pang and C. W. Tan, Energy Efficient and Low Latency Computation Offloading via Truly PPO in Mobile Edge Computing Networks with Multi-UAV, The 17th IEEE International Conference on Internet of Things (iThings), 2024.
- ◇ J.-Y. Zeng, F.-H. Tseng and C. W. Tan, Physical Adversarial Example in Car Plate Recognition Systems based on SA Algorithm, *IEEE Consumer Electronics Magazine*, 2024.

- ◇ Y. Wang, S. Guo, L. Ling and C. W. Tan, Nemobot: Crafting Strategic Gaming LLM Agents for K-12 AI Education, ACM Learning at Scale, 2024.
- ◇ S. C. Fung, M. F. Wong and C. W. Tan, Automatic Feedback Generation on K-12 Students' Data Science Education by Prompting Cloud-based Large Language Models, ACM Learning at Scale, 2024.
- ◇ C. W. Tan, S. Guo, M. Wong, C. Hang, Copilot for Xcode: Exploring AI-Assisted Programming by Prompting Cloud-based Large Language Models, International Joint Conference on Artificial Intelligence (IJCAI) Symposium on Large Language Models, 2023
- ◇ M.-F. Wong, S. Guo, C. Hang, S. Ho, C. W. Tan, Natural Language Generation and Understanding of Big Code for AI-Assisted Programming: A Review. Entropy, Vol. 25, No. 6: 888, 2023
- ◇ C. Hang, P. Yu and C. W. Tan, TrumorGPT: Query Optimization and Semantic Reasoning over Networks for Automated Fact-Checking, The 58th Annual Conference on Information Sciences and Systems (CISS), 2024
- ◇ C. W. Tan, P.-D. Yu, Contagion Source Detection in Epidemic and Infodemic Outbreaks: Mathematical Analysis and Network Algorithms, Foundations and Trends in Networking, Vol. 13, No. 2-3, pp. 107-251, 2023
- ◇ Y. Zhang and C. Li, C. W. Tan, On Symmetric Multilevel Diversity Coding System With Linear Computations, IEEE Commun. Lett., Vol. 27, No. 8, pp. 1994-1998, 2023
- ◇ C. Li, Y. Zhang, C. W. Tan, Fault-Tolerant Computation Meets Network Coding: Optimal Scheduling in Parallel Computing, IEEE Trans. Communications, Vol. 71, No. 7, pp. 3847-3860, 2023
- ◇ C. Hang, P. Yu, S. Chen, C. W. Tan, G. Chen, MEGA: Machine Learning-Enhanced Graph Analytics for Infodemic Risk Management, IEEE Journal of Biomedical and Health Informatics, Vol. 27, No. 12, pp. 6100-6111, 2023
- ◇ S. Chen and Chee-Wei Tan, Neural Sum Rate Maximization with Deep Unrolling, IEEE GLOBECOM 2023
- ◇ P.-D. Yu, C. W. Tan and H.-L. Fu, *Epidemic Source Detection in Contact Tracing Networks: Epidemic Centrality in Graphs and Message-Passing Algorithms*, IEEE Journal of Selected Topics in Signal Processing, Vol. 16, No. 2, pp. 234-249, 2022
- ◇ Z. Fei, Y. Ryzhnik, A. Sverdllov, C. W. Tan and W. K. Wong, *An Overview of Healthcare Data Analytics with Applications to the COVID-19 Pandemic*, IEEE Transactions on Big Data, Vol. 8, No. 6, pp. 1463-1480, 2022
- ◇ S. Chen, P.-D. Yu, C. W. Tan and H. V. Poor, *Identifying the Superspreader in Proactive Backward Contact Tracing by Deep Learning*, 56th Annual Conference on Information Sciences and Systems (CISS), 2022
- ◇ J. Li, C. W. Tan, C. Hang and X. Qi, *A Chatbot-Server Framework for Scalable Machine Learning Education through Crowdsourced Data*, ACM Learning at Scale, 2022
- ◇ J. Li, L. Ling and C. W. Tan, *Blending Peer Instruction with Just-In-Time Teaching: Jointly Optimal Task Scheduling with Feedback for Classroom Flipping*, ACM Learning at Scale, 2021
- ◇ C. Li, C. W. Tan, J. Li and S. Chen, *Fault-Tolerant Computation Meets Network Coding: Optimal Scheduling in Parallel Computing*, IEEE Globecom, 2021
- ◇ S. W. Ho, L. Ling, C. W. Tan and R. W. Yeung, *Proving and Disproving Information Inequalities: Theory and Scalable Algorithms*, IEEE Transactions on Information Theory, Vol. 66, No. 9, pp. 5522-5536, 2020
- ◇ S. Liu, C. Joe-Wong, J. Chen, C. Brinton, C. W. Tan and L. Zheng, *Economic Viability of a Virtual ISP*, IEEE/ACM Transactions on Networking, Vol. 28, No. 2, pp. 902-916, 2020

- ◇ L. Ling and C. W. Tan, *Scalable Automated Proving of Information Theoretic Inequalities with Proximal Algorithms*, IEEE International Symposium on Information Theory, 2019
- ◇ L. Ling and C. W. Tan, *Human-assisted Computation for Auto-grading*, ICDM Workshop on Machine Learning for Education, 2018
- ◇ L. Ling and C. W. Tan, *Pilot Study on Optimal Task Scheduling in Learning*, ACM Learning at Scale, 2018
- ◇ P. Yu, C. W. Tan and H. Fu, *Averting Cascading Failures in Networked Infrastructures: Poset-constrained Graph Algorithms*, IEEE Journal of Selected Topics in Signal Processing, Vol. 12, No. 4, 2018
- ◇ C. Li, X. Guang, C. W. Tan and Raymond W. Yeung, *Fundamental Limits on A Class of Secure Asymmetric Multilevel Diversity Coding Systems*, IEEE Journal on Selected Areas in Communications, Vol. 36, No. 4, 2018
- ◇ C. Kuo, C. N. Hang, P. Yu and C. W. Tan, *Parallel Counting of Triangles in Large Graphs: Pruning and Hierarchical Clustering Algorithms*, IEEE High Performance Extreme Computing Conference MIT-Amazon Graph Challenge (honorable mention), 2018
- ◇ P. Yu, C. W. Tan and H. Fu, *Graph Algorithms for Preventing Cascading Failures in Networks*, Proc. of 52nd CISS, 2018
- ◇ L. Zheng, D. Cai and C. W. Tan, *Max-min Fairness Rate Control in Wireless Networks: Optimality and Algorithms by Perron-Frobenius Theory*, IEEE Transactions on Mobile Computing, Vol. 17, No. 1, pp.127-140, 2018
- ◇ P. Yu, C. W. Tan and H. Fu, *Rumor Source Detection in Finite Graphs with Boundary Effects by Message Passing Algorithms*, Proc. of IEEE/ACM ASONAM, 2017
- ◇ P. Yu, C. W. Tan and H. Fu, *Rumor Source Detection in Unicyclic Graphs*, Proc. of IEEE Information Theory Workshop, 2017
- ◇ L. Zheng, C. Joe-Wong, C. W. Tan, S. Ha, M. Chiang, *Customized Data Plans for Mobile Users: Feasibility and Benefits of Data Trading*, IEEE Journal on Selected Areas in Communications, Vol. 35, No. 4, 2017
- ◇ C. W. Tan, P. Yu, C. Lai, W. Zhang and H. Fu, *Optimal Detection of Influential Spreaders in Online Social Networks*, Proc. of 50th CISS, 2016
- ◇ L. Zheng, C. Joe-Wong, C. Brinton, C. W. Tan and M. Chiang, *On the Viability of a Cloud Virtual Service Provider*, Proc. of ACM SIGMETRICS 2016
- ◇ F. Wong, C. W. Tan, S. Sen and M. Chiang, *Quantifying Political Leaning from Tweets, Retweets and Retweeters*, IEEE Transactions on Knowledge and Data Engineering, Vol. 28, No. 8, 2016
- ◇ L. Zheng, Y. W. Hong, C. W. Tan, C. L. Hsieh and C. H. Lee, *Wireless Max-min Utility Fairness with General Monotonic Constraints by Perron-Frobenius Theory*, IEEE Transactions on Information Theory, Vol. 62, No. 12, 2016
- ◇ C. W. Tan, *Optimal Power Control in Rayleigh-fading Heterogeneous Wireless Networks*, IEEE/ACM Transactions on Networking, Vol. 24, No. 2, 2016
- ◇ C. W. Tan, *Wireless Network Optimization by Perron-Frobenius Theory*, Now Publishers, Foundations and Trends in Networking, Vol. 9, No. 2-3, 2015
- ◇ L. Zheng, C. Joe-Wong, C. W. Tan, M. Chiang and X. Wang, *How to Bid the Cloud?*, Proc. of ACM SIGCOMM 2015
- ◇ S. W. Ho, C. W. Tan and R. W. Yeung, *Proving and Disproving Information Inequalities*, IEEE International Symposium on Information Theory, 2014
- ◇ L. Zheng and C. W. Tan, *A Probabilistic Characterization of the Rumor Graph Boundary in Rumor Source Detection*, Proc. of IEEE Digital Signal Processing, 2015

- ◇ Z. Wang, W. Dong, W. Zhang and C. W. Tan, *Rooting out Rumor Sources in Online Social Networks: The Value of Diversity from Multiple Observations*, IEEE Journal of Selected Topics in Signal Processing, Vol. 9, No. 4, 2015
- ◇ Z. Wang, W. Dong, W. Zhang and C. W. Tan, *Rumor Source Detection with Multiple Observations: Fundamental Limits and Algorithms*, Proc. of ACM SIGMETRICS 2014
- ◇ N. Chen, C. W. Tan and T. Quek, *Electric Vehicle Charging in Smart Grid: Optimality and Valley-Filling Algorithms*, IEEE Journal of Selected Topics in Signal Processing, Vol. 8, No. 6, 2014
- ◇ W. Dong, W. Zhang and C. W. Tan, *Rooting out the Rumor Culprit from Suspects*, Proc. of IEEE Intl. Symp. on Information Theory, 2013
- ◇ F. M. F. Wong, C. W. Tan, S. Sen and M. Chiang, *Quantifying Political Leaning from Tweets and Retweets*, Seventh International AAAI Conference on Weblogs and Social Media (ICWSM), 2013
- ◇ L. Zheng and C. W. Tan, *Maximizing Sum Rates in Cognitive Radio Networks: Convex Relaxation and Global Optimization Algorithms*, IEEE Journal on Selected Areas in Communications, Vol. 32, No. 3, 2014
- ◇ X. Zhai, L. Zheng and C. W. Tan, *Energy-Infeasibility Tradeoff in Cognitive Radio Networks: Price-Driven Spectrum Access Algorithms*, IEEE Journal on Selected Areas in Communications, Vol. 32, No. 3, pp. 528-538, 2014
- ◇ L. Zheng and C. W. Tan, *Cognitive Radio Network Duality and Algorithms for Utility Maximization*, IEEE Journal on Selected Areas in Communications, Vol. 31, No. 3, 2013
- ◇ C. W. Tan, M. Chiang and R. Srikant, *Fast Algorithms and Performance Bounds for Sum Rate Maximization in Wireless Networks*, IEEE/ACM Transactions on Networking, Vol. 21, No. 3, 2013
- ◇ C. W. Tan, S. Friedland and S. H. Low, *Nonnegative Matrix Inequalities and Their Application to Nonconvex Power Control Optimization*, SIAM Journal on Matrix Analysis and Applications, Vol. 32, No. 3, 2011
- ◇ C. W. Tan, S. Friedland and S. H. Low, *Spectrum Management in Multiuser Cognitive Wireless Networks: Optimality and Algorithm*, IEEE Journal on Selected Areas in Communications, Vol. 29, No. 2, 2011
- ◇ Y. Zhao, C. W. Tan, A. S. Avestimehr, S. N. Diggavi and G. J. Pottie, *On the Maximum Achievable Sum-rate with Successive Decoding in Interference Channels*, IEEE Transactions on Information Theory, Vol. 58, No. 6, 2012
- ◇ L. Yang, H. Kim, J. Zhang, M. Chiang and C. W. Tan, *Pricing-based Decentralized Spectrum Access Control in Cognitive Radio Networks*, IEEE/ACM Transactions on Networking, Vol. 21, No. 2, pp. 522-535, 2013
- ◇ S. Sorooshyari, C. W. Tan and M. Chiang, *Power Control for Cognitive Radio Networks: Axioms, Algorithms, and Analysis*, IEEE/ACM Transactions on Networking, Vol. 20, No. 3, pp. 878-891, 2012
- ◇ M. Wang, C. W. Tan, W. Xu and A. Tang, *Cost of Not Splitting in Routing: Characterization and Estimation*, IEEE/ACM Transactions on Networking, Vol. 19, No. 6, 2011
- ◇ C. W. Tan, D. P. Palomar and M. Chiang, *Energy-Robustness Tradeoff in Cellular Network Power Control*, IEEE/ACM Transactions on Networking, Vol. 17, No. 3, 2009
- ◇ C. W. Tan and A. R. Calderbank, *Multiuser Detection of Alamouti Signals*, IEEE Transactions on Communications, Vol. 57, No. 7, 2009

MONOGRAPH ◇ C. W. Tan and P. D. Yu, *Contagion Source Detection in Epidemic and Infodemic Outbreaks: AND EDITED Mathematical Analysis and Network Algorithms*, Now Publishers, Foundations and Trends BOOKS in Networking, ISBN: 978-1-63828-250-1, 2023.

- ◇ C. W. Tan (Ed.), *Online Social Networks: Perspectives, Applications and Developments*, Nova Science Publishers, 2020.
 - ◇ C. W. Tan, *Wireless Network Optimization by Perron-Frobenius Theory*, Now Publishers, Foundations and Trends in Networking, ISBN: 978-1-68083-050-7, 2015.
 - ◇ C. W. Tan (Ed.), *Cognitive Radio Networks: Performance, Applications and Technology*, Nova Science Publishers, 2018.
 - ◇ M. Chiang, P. Hande, T. Lan and C. W. Tan, *Power Control in Wireless Cellular Networks*, Now Publishers, Foundations and Trends in Networking, ISBN: 978-1601981363, 2007.
- RECENT TALK AND INVITED TUTORIAL
- ◇ 2024 Reunion Workshop on Optimization Control of Networks: from Theory to Practice, Caltech Netlab, California Institute of Technology, “Large-Scale Optimization of Convex-Concave Games in Networks”, May 2024
 - ◇ IEEE Information Theory Workshop Tutorial “Unraveling Contagion Origins: Mathematical Analysis, Network Algorithms and Applications to Epidemics and Infodemics”, November 2024
 - ◇ Keynote for 2024 International Conference on Artificial Intelligence and Machine Learning Research (CAIMLR), “Generative Agents in AI-driven Networks”, September 2024
 - ◇ Keynote for 2022 IEEE 6th International Symposium on Telecommunication Technologies, “Perspectives on Artificial Intelligence for Sustainable Networking: From 5G to Blockchains”, November 2022
 - ◇ Information Inequalities: Facets of Entropy and Automated Reasoning by Optimization, (with R. W. Yeung and S. W. Ho), IEEE International Symposium on Information Theory, Jun 2022
 - ◇ 2022 IEEE Malaysia Communications Society & Vehicular Technology Society ComSoc School Series, “Artificial Intelligence: Past, Present and Future”, June 2022
 - ◇ Healthcare Big Data Analytics for COVID-19 Challenges: Digital Contact Tracing and Infodemic Management, IEEE Conference on Big Data, Dec 2021
 - ◇ 5. 4th EAI International Conference on Machine Learning and Intelligent Communications Keynote Speaker, “Network Centrality as Statistical Inference in Large Networks,” August 2019
 - ◇ Artificial Intelligence at Scale: Automated Reasoning by Convex Optimization Princeton University (2019), UCLA (2018).
 - ◇ Network Centrality as Statistical Inference in Large Networks INFORMS International Conference 2018, University of Notre Dame Workshop on Big Data Challenges for Predictive Modeling of Complex Systems 2018, 2018 Smart Grid Seminar at California Institute of Technology, 2018 Institute for Pure and Applied Mathematics (IPAM) Seminar Series.
 - ◇ Statistical Inference for Cyber-Security in Networks IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM) Conference Tutorial 2017
 - ◇ Statistical Inference for Cyber-Security in Networks International Conference on Acoustics, Speech, and Signal Processing (ICASSP) in 2016
- PROFESSIONAL SERVICES
- ◇ Publication Chair, IEEE Conference on Artificial Intelligence (CAI) 2025
 - ◇ Chair, Symposium of AI-enabled Networks, 2025 IEEE Global Communications Conference (IEEE GLOBECOM)
 - ◇ Steering Committee Member, ACM Learning at Scale (L@S)
 - ◇ Editor, IEEE Transactions on Cognitive Communications and Networking (2022 - present)
 - ◇ Editor, BMC Archives of Public Health, Health Information Systems (2021 - present)

- ◇ Editor, IEEE/ACM Transactions on Networking (2016-2020)
- ◇ Editor, IEEE Transactions on Communications (2012-2018)
- ◇ Organizer, Conference on Information Sciences and Systems (CISS) Special Session on Optimization and its Applications in Artificial Intelligence, Princeton NJ, 2020, 2022
- ◇ Technical Program Committee Member, ACM SIGMETRICS (2021,2020), ACM MobiHoc (2019,2020), IEEE INFOCOM
- ◇ Technical Program Committee Co-Chair, Modeling and Optimization in Mobile, Ad-Hoc and Wireless Networks (WiOpt) 2019
- ◇ Co-Chair, ICDM Data Mining for eLearning Personalization Workshop, Singapore, 2018
- ◇ Chair, Croucher Workshop on Information Theory, Hong Kong, 2015

PATENTS
GRANTED

- ◇ Method and apparatus for matching buyers with sellers in a marketplace to facilitate trade, United States Patent No. US11030690B2, Inventor: L. Zheng and C. W. Tan, Filed 31 August 2015, Granted 8th June 2021.