

Vincent Y. F. Tan

Department of Electrical and Computer Engineering

Department of Mathematics

National University of Singapore, Singapore 119077

Telephone: +65-65162133

Email: vtan@nus.edu.sg

Website: <http://www.ece.nus.edu.sg/stfpage/vtan/>

Research Interests

Machine Learning, Network Information Theory, Statistical Signal Processing

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

Associate Professor, Dept. of Electrical and Computer Engineering (ECE) and Dept. of Mathematics, National University of Singapore (NUS)

Jan 2018 - present. Teaching classes and advising graduate students

Assistant Professor, Dept. of Mathematics, National University of Singapore (NUS)

Jul 2014 - Dec 2017. Teaching classes and advising graduate students

Assistant Professor, Dept. of Electrical and Computer Engineering (ECE), NUS

Jan 2014 - Dec 2017. Teaching classes and advising graduate students

Scientist, Data Analytics Dept., Institute for Infocomm Research (I²R), Agency for Science, Technology and Research (A*STAR), Singapore

Feb 2012 - Dec 2013. Designing algorithms for analyzing high-dimensional data

Adjunct Assistant Professor, Dept. of ECE, NUS

Apr 2012 - Dec 2013. Teaching classes and advising graduate students

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

Graduate Research Assistant, Laboratory for Information and Decision Systems, Dept. of Electrical Engineering and Computer Science, Massachusetts Institute of Technology

Jan 2007 - Dec 2010. Advised by Prof. Alan Willsky and performed research in signal processing and machine learning, specifically in the learning of graphical models

Intern, E-Science Research Group, Microsoft Research Los Angeles, CA

Summer 2009. Worked with Dr. David Heckerman and Dr. Jonathan Carlson on machine learning techniques to infer structure and parameters of evolutionary trees

Intern, Machine Learning and Perception Group, Microsoft Research Cambridge U.K.

Summer 2008. Worked with Prof. Christopher Bishop, Dr. John Winn and clinician scientists in the University of Manchester, UK to apply Bayesian graphical modeling techniques to categorize childhood asthma classes automatically

Significant Grants

2018: National Research Foundation (NRF) Fellowship “Fundamental Limits for Statistical Learning Algorithms” (SGD \$2,060,000)

2017: NRF Cybersecurity R&D Programme Grant “Machine Learning, Robust Optimisation, and Verification: Creating Synergistic Capabilities in Cybersecurity” (SGD \$379,000)

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)

Awards and Honors

2018: NUS Faculty of Engineering Young Researcher Award

2018: Singapore National Research Foundation (NRF) Fellowship (Class of 2018)

2016: Finalist for the Singapore Young Scientist Award

2015/6: Faculty of Engineering Teaching Commendation Award

2014: NUS Young Investigator Award

2014: Co-author of a paper shortlisted for the Best Student Paper Award of the IEEE Intl. Symposium on Information Theory

2011: Philip Yeo Prize for Outstanding Achievements in Research

2011: EECS Jin-Au Kong Outstanding Doctoral Thesis Prize

2009: Student Travel Award for the IEEE Intl. Symposium on Information Theory

2006: A*STAR National Science Scholarship
Full funding for Ph.D. studies at MIT

2005: Charles Lamb Prize: Top M.Eng. student in the Electrical and Information Sciences Tripos in Cambridge University

2001: Overseas Merit Scholarship, Public Service Commission (PSC)
Full funding for undergraduate studies in Cambridge University

Teaching Experiences

Instructor, MA4270, Data Modeling and Computation at Math NUS (Spring 2016, Spring 2017, Spring 2018)

Instructor, EE5137, Stochastic Processes at ECE-NUS (Fall 2017)

Instructor, EE5138R, Optimization for Comm. Systems at ECE-NUS (Spring 2015)

Instructor, EE5139R, Information Theory for Comm. Systems at ECE-NUS (Fall 2014–2016)

Co-Instructor, EE5139R Communication Systems at NUS (Fall 2012, Fall 2013)
Ratings at least one standard deviation above average in ECE Dept. Level 5000 courses

Tutorials, EE2012 Analytical Methods at NUS (Fall 2006, Spring 2013)

Instructor, Network Information Theory at University of Wisconsin-Madison (Fall 2011)

Teaching Assistant, 6.437 Inference and Information at MIT
Taught by Prof. Greg Wornell, Spring 2010, Rating 6.4/7.0.

Teaching Assistant, 6.241 Dynamic Systems and Control at MIT
Taught by Prof. Munther Dahleh, Fall 2008, Rating 6.5/7.0.

- Publications** A full list of publications is given in Appendix A, or from the following website:
<http://www.ece.nus.edu.sg/stfpage/vtan/pubs.htm>
- Professional Activities**
- Guest Editor, Special Issue on “Information-Theoretic Methods in Data Acquisition, Analysis, and Processing” of the *IEEE Journal on Selected Topics in Signal Processing* (2017–2018)
- Editor, *IEEE Transactions on Green Communications and Networking* (2016–present)
- Editor, *IEEE Transactions on Communications* (2015–present)
- Member of the IEEE Machine Learning and Signal Processing Technical Committee (2012–2015)
- Senior Member, IEEE and Member of the IEEE Information Theory Society
- Technical Program Committee Member for the following conferences
- IEEE Intl. Symposium on Information Theory (2014–2018)
 - IEEE Intl. Workshop on Machine Learning and Signal Processing (2013)
 - IEEE Intl. Conference on Acoustics, Speech and Signal Processing (2013, 2014)
- Reviewer for the following journals
- IEEE Transactions on Information Theory
 - IEEE Transactions on Signal Processing
 - Journal of Machine Learning Research
- Co-organized the “Beyond i.i.d. in information theory” workshop in NUS (2014, 2017)
- Students**
- Ms. ZHONG Zixin (PhD expected in 2021; Math Dept.)
- Mr. ANDERSON Boyd (PhD expected in 2019; Computer Science Dept.; Co-supervised with Y. Wang)
- Mr. ZHOU Lin (PhD expected in 2018; ECE Dept.; Co-supervised with M. Motani)
- Mr. TRUONG Vinh Lan (PhD expected in 2018; ECE Dept)
- Mr. CAO Daming (Exchange student from Southeast University China; ECE Dept)
- Mr. ZHAO Renbo (M.Sc. expected in 2018; Math Dept.)
- Mr. LIU Zhaoqiang (PhD 2017; Math Dept.; Co-supervised with W. Bao)
- Mr. LE Sy Quoc (PhD 2014, co-supervised with Prof. Mehul Motani)

Appendix A: Vincent Y. F. Tan's Publications

Monographs

- M1. Vincent Y. F. Tan, “Asymptotic Estimates in Information Theory with Non-Vanishing Error Probabilities” *Foundations and Trends on Communications and Information Theory*, vol. 11, no. 1-2, pp. 1 - 184, 2014

Journal Papers

The symbols * and † denote students and postdocs supervised by V. Y. F. Tan respectively.

- J1. Jiachun Liao, Lalitha Sankar, Vincent Y. F. Tan, and Flavio du Pin Calmon, “Hypothesis Testing under Mutual Information Privacy Constraints in the High Privacy Regime”, *IEEE Transactions on Information Forensics and Security*, Vol. 13, No. 4, pp. 1058 – 1071, Apr 2018
- J2. Lan V. Truong* and Vincent Y. F. Tan, “On Gaussian MACs with Variable-Length Feedback and Non-Vanishing Error Probabilities”, *IEEE Transactions on Information Theory*, 2018+
- J3. Vincent Y. F. Tan and Masahito Hayashi, “Analysis of Remaining Uncertainties and Exponents under Various Conditional Rényi Entropies”, *IEEE Transactions on Information Theory*, 2018+
- J4. Mladen Kovačević† and Vincent Y. F. Tan, “Codes in the Space of Multisets–Coding for Permutation Channels with Impairments”, *IEEE Transactions on Information Theory*, 2018+
- J5. Lin Zhou*, Vincent Y. F. Tan and Mehul Motani, “Achievable Moderate Deviations Asymptotics for Streaming Slepian-Wolf Coding”, *IEEE Transactions on Information Theory*, 2018+
- J6. Silas L. Fong†, Vincent Y. F. Tan and Ayfer Özgür, “On Achievable Rates of AWGN Energy-Harvesting Channels with Block Energy Arrival and Non-Vanishing Error Probabilities”, *IEEE Transactions on Information Theory*, 2018+
- J7. Renbo Zhao*, Vincent Y. F. Tan and William B. Haskell, “Stochastic L-BFGS Revisited: Improved Convergence Rates and Practical Acceleration Strategies”, *IEEE Transactions on Signal Processing*, 2018+
- J8. Masahito Hayashi and Vincent Y. F. Tan, “Minimum Rates of Approximate Sufficient Statistics”, *IEEE Transactions on Information Theory*, Vol. 64, No. 2, pp. 875 – 888, Feb 2018
- J9. Renbo Zhao* and Vincent Y. F. Tan, “A Unified Convergence Analysis of the Multiplicative Update Algorithm for Regularized NMF”, *IEEE Transactions on Signal Processing*, Vol. 66, No. 1, pp. 129 – 138, Jan 2018
- J10. Silas L. Fong† and Vincent Y. F. Tan, “A Proof of the Strong Converse Theorem for Gaussian Broadcast Channels via the Gaussian Poincaré Inequality”, *IEEE Transactions on Information Theory*, Vol. 63, No. 12, pp. 7737 – 7746, Dec 2017
- J11. Mladen Kovačević†, Miloš Stojaković, and Vincent Y. F. Tan, “Zero-Error Capacity of P -ary Shift Channels and FIFO Queues”, *IEEE Transactions on Information Theory*, Vol. 63, No. 12, pp. 7698 – 7707, Dec 2017
- J12. Christopher T. Chubb, Vincent Y. F. Tan and Marco Tomamichel, “Moderate Deviations Analysis for Classical Communication over Quantum Channels,” *Communications in Mathematical Physics*, Vol. 355, No. 3, pp. 1283 – 1315, Nov 2017
- J13. Silas L. Fong† and Vincent Y. F. Tan, “A Tight Upper Bound on the Second-Order Coding Rate for Parallel Gaussian Channels with Feedback”, *IEEE Transactions on Information Theory*, Vol. 63, No. 10, pp. 6474 – 6486, Oct 2017
- J14. Mladen Kovačević† and Vincent Y. F. Tan, “Improved Bounds on Sidon Sets via Lattice Packing of Simplices”, *SIAM Journal on Discrete Mathematics*, Vol. 31, No. 3, pp. 2269 – 2278, Sep 2017
- J15. Zhaoqiang Liu* and Vincent Y. F. Tan, “Rank-One NMF-Based Initialization for NMF and Relative Error Bounds under a Geometric Assumption”, *IEEE Transactions on Signal Processing*, Vol. 65, No. 18, pp. 4717 – 4731, Sep 2017
- J16. Silas L. Fong† and Vincent Y. F. Tan, “Scaling Exponent and Moderate Deviations Asymptotics of Polar Codes for the AWGN Channel”, *Entropy*, Vol. 19, No. 7, Article 364, Jul 2017

- J17. Silas L. Fong[†] and Vincent Y. F. Tan, “Achievable Rates for Gaussian Degraded Relay Channels with Non-Vanishing Error Probabilities”, *IEEE Transactions on Information Theory*, Vol. 63, No. 7, pp. 4183 – 4201, Jul 2017
- J18. Lin Zhou*, Vincent Y. F. Tan, and Mehul Motani, “Second-Order and Moderate Deviation Asymptotics for Successive Refinement”, *IEEE Transactions on Information Theory*, Vol. 63, No. 5, pp. 2896 – 2921, May 2017
- J19. Si-Hyeon Lee, Vincent Y. F. Tan, and Ashish Khisti, “Exact Moderate Deviation Asymptotics for Streaming Data Transmission”, *IEEE Transactions on Information Theory*, Vol. 63, No. 5, pp. 2726 – 2736, May 2017
- J20. Eldho K. Thomas[†], Vincent Y. F. Tan, Alexander Vardy and Mehul Motani, “Polar Coding for the Binary Erasure Channel with Deletions”, *IEEE Communication Letters*, Vol. 21, No. 4, pp. 710 – 713, Apr 2017
- J21. Changho Suh, Vincent Y. F. Tan, and Renbo Zhao*, “Adversarial Top- K Ranking”, *IEEE Transactions on Information Theory*, Vol. 63, No. 4, pp. 2201 – 2225, Apr 2017
- J22. Lin Zhou*, Vincent Y. F. Tan, and Mehul Motani “Discrete Lossy Gray-Wyner Revisited: Second-Order Asymptotics, Large and Moderate Deviations”, *IEEE Transactions on Information Theory*, Vol. 63, No. 3, pp. 1766 - 1791, Mar 2017
- J23. Lan V. Truong*, Silas L. Fong[†] and Vincent Y. F. Tan, “On Gaussian Channels with Feedback under Expected Power Constraints and with Non-Vanishing Error Probabilities”, *IEEE Transactions on Information Theory*, Vol. 63, No. 3, pp. 1746 - 1765, Mar 2017
- J24. Masahito Hayashi and Vincent Y. F. Tan, “Equivocations, Exponents and Second-Order Coding Rates under Various Rényi Information Measures”, *IEEE Transactions on Information Theory*, Vol. 63, No. 2, pp. 975 - 1005, Feb 2017
- J25. Renbo Zhao* and Vincent Y. F. Tan, “Online Nonnegative Matrix Factorization with Outliers”, *IEEE Transactions on Signal Processing*, Vol. 65, No. 3, pp. 555 - 570, Feb 2017
- J26. Jonathan Scarlett, Vincent Y. F. Tan, and Giuseppe Durisi, “The Dispersion of Nearest-Neighbor Decoding for Additive Non-Gaussian Channels”, *IEEE Transactions on Information Theory* Vol. 62, No. 12, pp. 81 - 92, Jan 2017
- J27. Si-Hyeon Lee, Vincent Y. F. Tan and Ashish Khisti, “Streaming Data Transmission in the Moderate Deviations and Central Limit Regimes”, *IEEE Transactions on Information Theory*, Vol. 62, No. 12, pp. 6816 - 6830, Dec 2016
- J28. Silas L. Fong[†] and Vincent Y. F. Tan, “On the Scaling Exponent of Polar Codes for Binary-Input Energy-Harvesting Channels,” *IEEE Journal of Selected Areas in Communications*, Vol. 34, No. 12, pp. 3540 - 3551, Dec 2016
- J29. Silas L. Fong[†] , Vincent Y. F. Tan and Jing Yang, “Non-Asymptotic Achievable Rates for Energy-Harvesting Channels using Save-and-Transmit,” *IEEE Journal of Selected Areas in Communications*, Vol. 34, No. 12, pp. 3499 - 3511, Dec 2016
- J30. Silas L. Fong[†] and Vincent Y. F. Tan, “Strong Converse Theorems for Classes of Multimesage Multicast Networks: A Rényi Divergence Approach,” *IEEE Transactions on Information Theory*, Vol. 62, No. 9, pp. 4953 - 4967, Sep 2016
- J31. Silas L. Fong[†] and Vincent Y. F. Tan, “A Proof of the Strong Converse Theorem for Gaussian Multiple Access Channels,” *IEEE Transactions on Information Theory*, Vol. 62, No. 8, pp. 4376 - 4394, Aug 2016
- J32. Jonathan M. Carlson, Victor Y. Du, Nico Pfeifer, Anju Bansal, Vincent Y. F. Tan, Karen Power, Chanson J. Brumme, Anat Kreimer, Charles E. DeZiel, Nicolo Fusi, Malinda Schaefer, Mark A. Brockman, Jill Gilmour, Matt A. Price, William Kilembe, Richard Haubrich, Mina John, Simon Mallal, Roger Shapiro, John Frater, P. Richard Harrigan, Thumbi Ndung’u, Susan Allen, David Heckerman, John Sidney, Todd M. Allen, Philip J. R. Goulder, Zabrina L. Brumme, Eric Hunter, Paul A. Goepfert, “Impact of Pre-Adapted HIV Transmission”, *Nature Medicine*, Vol. 22, No. 6, pp. 606 - 613, Jun 2016
- J33. Fan Cheng[†] and Vincent Y. F. Tan, “A Numerical Study on the Wiretap Network with a Simple Network Topology”, *IEEE Transactions on Information Theory*, Vol. 62, No. 5, pp. 2481 - 2492, May 2016

- J34. Jonathan Scarlett and Vincent Y. F. Tan, “Second-Order Asymptotics for the Gaussian MAC with Degraded Message Sets”, *IEEE Transactions on Information Theory*, Vol. 61, No. 12, pp. 6700 - 6718, Dec 2015
- J35. Masahito Hayashi and Vincent Y. F. Tan, “Asymmetric Evaluations of Erasure and Undetected Error Probabilities” *IEEE Transactions on Information Theory*, Vol. 61, No. 12, pp. 6560 - 6577, Dec 2015
- J36. Yanina Shkel, Vincent Y. F. Tan and Stark C. Draper, “Unequal Message Protection: Asymptotic and Non-Asymptotic Tradeoffs”, *IEEE Transactions on Information Theory*, Vol. 61, No. 10, pp. 5396 - 5416, Oct 2015
- J37. Vincent Y. F. Tan and Matthieu R. Bloch, “Information Spectrum Approach to Strong Converse Theorems for Degraded Wiretap Channels”, *IEEE Transactions on Information Forensics and Security*, Vol. 10, No. 9, pp. 1891 - 1904, Sep 2015
- J38. Marco Tomamichel and Vincent Y. F. Tan, “Second-Order Asymptotics for the Classical Capacity of Image Additive Quantum Channels,” *Communications in Mathematical Physics*, Vol. 338, No. 1, pp. 103 - 137, Aug 2015
- J39. Sy-Quoc Le*, Vincent Y. F. Tan and Mehul Motani, “A Case Where Interference Does Not Affect the Channel Dispersion,” *IEEE Transactions on Information Theory*, Vol. 61, No. 5, pp. 2439 - 2453, May 2015
- J40. Vincent Y. F. Tan and Marco Tomamichel, “The Third-Order Term in the Normal Approximation for the AWGN Channel,” *IEEE Transactions on Information Theory*, Vol. 61, No. 5, pp. 2430 - 2438, May 2015
- J41. Shun Watanabe, Shigeaki Kuzuoka and Vincent Y. F. Tan, “Non-Asymptotic and Second-Order Achievability Bounds for Coding With Side-Information,” *IEEE Transactions on Information Theory*, Vol. 61, No. 4, pp. 1574 - 1605, Apr 2015
- J42. Vincent Y. F. Tan, “On the Reliability Function of the Discrete Memoryless Relay Channel,” *IEEE Transactions on Information Theory*, Vol. 61, No. 4, pp. 1550 - 1573, Apr 2015
- J43. Tzu-Han Chou, Vincent Y. F. Tan and Stark C. Draper, “The Sender-Excited Secret-Key Agreement Model: Capacity, Reliability and Secrecy Exponents,” *IEEE Transactions on Information Theory*, Vol. 61, No. 1, pp. 609 - 627, Jan 2015
- J44. Hong Cao, Vincent Y. F. Tan and John Z. F. Pang, “A Parsimonious Mixture of Gaussian Trees Model for Oversampling in Imbalanced and Multi-Modal Time-Series Classification” *IEEE Transactions on Neural Networks and Learning Systems*, Vol. 25, No. 12, pp. 2226 - 2239, Dec 2014
- J45. Marco Tomamichel and Vincent Y. F. Tan, “Second-Order Coding Rates for Channels with State,” *IEEE Transactions on Information Theory*, Vol. 60, No. 8, pp. 4427 - 4448, Aug 2014
- J46. Vincent Y. F. Tan, “A Formula for the Capacity of the General Gel’fand-Pinsker Channel” *IEEE Transactions on Communications*, Vol. 62, No. 6, pp. 1857 - 1870, Jun 2014
- J47. Vincent Y. F. Tan and George K. Atia, “Strong Impossibility Results for Sparse Signal Processing,” *IEEE Signal Processing Letters*, Vol. 21, No. 3, pp. 260 - 264, Mar 2014
- J48. Vincent Y. F. Tan and Oliver Kosut, “On the Dispersions of Three Network Information Theory Problems,” *IEEE Transactions on Information Theory*, Vol. 60, No. 2, pp. 883 - 903, Feb 2014
- J49. Marco Tomamichel and Vincent Y. F. Tan, “A Tight Upper Bound for the Third-Order Asymptotics for Most Discrete Memoryless Channels,” *IEEE Transactions on Information Theory*, Vol. 59, No. 11, pp. 7041 - 7051, Nov 2013
- J50. Gang Yang, Vincent Y. F. Tan, Chin Keong Ho, See Ho Ting and Yong Liang Guan, “Wireless Compressive Sensing for Energy Harvesting Sensor Nodes over Fading Channels,” *IEEE Transactions on Signal Processing*, Vol. 61, No. 18, pp. 4491 - 4505, Sep 2013
- J51. Vincent Y. F. Tan and Cédric Févotte, “Automatic Relevance Determination in Nonnegative Matrix Factorization with the β -Divergence,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 35, No. 7, pp. 1592 - 1605, Jul 2013
- J52. Animashree Anandkumar, Vincent Y. F. Tan, Furong Huang and Alan S. Willsky, “High-Dimensional Gaussian Graphical Model Selection: Walk Summability and Local Separation Criterion,” *Journal of Machine Learning Research*, Vol. 13, pp. 2293 - 2337, Aug 2012

- J53. Animashree Anandkumar, Vincent Y. F. Tan, Furong Huang and Alan S. Willsky, “High-Dimensional Structure Estimation of Ising Models: Local Separation Criterion,” *Annals of Statistics*, Vol. 40, No. 3, pp. 1346 - 1375, 2012
- J54. Jonathan M. Carlson, Jennifer Listgarten, Nico Pfeifer, Vincent Y. F. Tan, Carl Kadie, Bruce D. Walker, Thumbi Ndung’u, Roger Shapiro, John Frater, Zabrina L. Brumme, Philip J. R. Goulder, David Heckerman, “Widespread Impact of HLA Restriction on Immune Control and Escape Pathways in HIV-1” *Journal of Virology*, Vol. 86, No. 9, pp. 5230 - 5243, May 2012.
- J55. Vincent Y. F. Tan, Laura Balzano and Stark C. Draper, “Rank Minimization over Finite Fields: Fundamental Limits and Coding-Theoretic Interpretations,” *IEEE Transactions on Information Theory*, Vol. 58, No. 4, pp. 2018 - 2039, Apr 2012
- J56. Myung Jin Choi, Vincent Y. F. Tan, Animashree Anandkumar and Alan S. Willsky, “Learning Latent Tree Graphical Models,” *Journal of Machine Learning Research*, Vol. 12, pp. 1771 - 1812, May 2011
- J57. Vincent Y. F. Tan, Animashree Anandkumar and Alan S. Willsky, “Learning High-Dimensional Markov Forest Distributions: Analysis of Error Rates,” *Journal of Machine Learning Research*, Vol. 12, pp. 1617 - 1653, May 2011
- J58. Vincent Y. F. Tan, Animashree Anandkumar, Lang Tong and Alan S. Willsky, “A Large-Deviation Analysis of the Maximum-Likelihood Learning of Markov Tree Structures,” *IEEE Transactions on Information Theory*, Vol. 57, No. 3, pp. 1714 - 1735, Mar 2011
- J59. Vincent Y. F. Tan, Sujay Sanghavi, John W. Fisher III and Alan S. Willsky, “Learning Graphical Models for Hypothesis Testing and Classification,” *IEEE Transactions on Signal Processing*, Vol. 58, No. 11, pp. 5481 - 5495, Nov 2010
- J60. Angela Simpson[@], Vincent Y. F. Tan[@], John Winn, Markus Svensen, Chris Bishop, David Heckerman, Iain Buchan and Adnan Custovic, “Beyond Atopy: Multiple Patterns of Sensitization in Relation to Asthma in a Birth Cohort Study,” *American Journal of Respiratory and Critical Care Medicine*, Vol. 181, pp. 1200 - 1206, Jun 2010 ([@]Co-first Authorship)
- J61. Vincent Y. F. Tan, Animashree Anandkumar and Alan S. Willsky, “Learning Gaussian Tree Models: Analysis of Error Exponents and Extremal Structures,” *IEEE Transactions on Signal Processing*, Vol. 58, No. 5, pp. 2701 - 2714, May 2010
- J62. Vincent Y. F. Tan and Vivek K. Goyal, “Estimating Signals with Finite Rate of Innovation from Noisy Samples: A Stochastic Algorithm,” *IEEE Transactions on Signal Processing*, Vol. 56, No. 10, pp. 5135 - 5145, Oct 2008

Conference Papers

- C1. Ling-Hua Chang, Carol Wang, Po-Ning Chen, Yunghsiang Han and Vincent Y. F. Tan, “Distance Spectrum Formula for the Largest Minimum Hamming Distance of Finite-Length Binary Block Codes”, *IEEE Information Theory Workshop*, Kaohsiung, Taiwan, 2017
- C2. Cheng-Hsiung Liu, I-Hsiang Wang and Vincent Y. F. Tan, “Delay Scaling Laws of Random Wireless Networks: Impact of Blocklength”, *IEEE Information Theory Workshop*, Kaohsiung, Taiwan, 2017
- C3. Mehrdad Tahmasbi, Matthieu L. Bloch and Vincent Y. F. Tan, “Error Exponent for Covert Communications over Discrete Memoryless Channels”, *IEEE Information Theory Workshop*, Kaohsiung, Taiwan, 2017
- C4. Selma Belhadj Amor and Vincent Y. F. Tan, “On the Gaussian MAC with Degraded Message Sets and Long-Term Power Constraints”, *IEEE Information Theory Workshop*, Kaohsiung, Taiwan, 2017
- C5. Silas L. Fong and Vincent Y. F. Tan, “A Tight Upper Bound on the Second-Order Coding Rate of Parallel Gaussian Channels with Feedback”, *IEEE Information Theory Workshop*, Kaohsiung, Taiwan, 2017
- C6. Mine Alsan and Vincent Y. F. Tan, “Robust Decoding Schemes for Polar Coding over Compound Channels”, *IEEE Information Theory Workshop*, Kaohsiung, Taiwan, 2017
- C7. Renbo Zhao, William B. Haskell, and Vincent Y. F. Tan, “Stochastic L-BFGS Revisited: Improved Convergence Rates and Practical Acceleration Strategies”, *Proceedings of the Uncertainty in Artificial Intelligence (UAI) Conference*, Sydney, Australia, 2017

- C8. Ting-Yi Wu, Lav Varshney and Vincent Y. F. Tan, “Communication over a Channel that Wears Out”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C9. Mladen Kovačević and Vincent Y. F. Tan, “Coding for the Permutation Channel with Insertions, Deletions, Substitutions, and Erasures”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C10. Jiachun Liao, Lalitha Sankar, Flavio du Pin Calmon, and Vincent Y. F. Tan, “Hypothesis Testing under Maximal Leakage Privacy Constraints”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C11. Masahito Hayashi and Vincent Y. F. Tan, “Minimum Rates of Approximate Sufficient Statistics”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C12. Christopher Chubb, Vincent Y. F. Tan, and Marco Tomamichel, “Moderate Deviation Analysis for Classical Communication over Quantum Channels”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C13. Si-Hyeon Lee, Vincent Y. F. Tan, and Ashish Khisti, “Exact Moderate Deviation Asymptotics in Streaming Data Transmission”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C14. Silas L. Fong, Vincent Y. F. Tan, and Ayfer Ozgur, “On Achievable Rates of AWGN Energy-Harvesting Channels with Block Energy Arrival and Non-Vanishing Error Probabilities”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C15. Silas L. Fong and Vincent Y. F. Tan, “Strong Converse Theorems for Discrete Memoryless Networks with Tight Cutset Bounds”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C16. Lin Zhou, Vincent Y. F. Tan, and Mehul Motani, “Strong Converse for Content Identification with Lossy Recovery”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C17. Lin Zhou, Vincent Y. F. Tan, and Mehul Motani, “Achievable Moderate Deviation Asymptotics for Streaming Slepian-Wolf Coding”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C18. Lan V. Truong and Vincent Y. F. Tan, “Error Exponent of the Common-Message Broadcast Channel with Variable-Length Feedback”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C19. Lan V. Truong and Vincent Y. F. Tan, “On the Gaussian MAC with Stop-Feedback”, *IEEE International Symposium on Information Theory*, Aachen, Germany, 2017
- C20. Renbo Zhao, Vincent Y. F. Tan, and Huan Xu “Online Nonnegative Matrix Factorization with General Divergences”, *International Conference on Artificial Intelligence and Statistics (AISTATS)*, Fort Lauderdale, FL, 2017
- C21. Zhaoqiang Liu and Vincent Y. F. Tan, “Relative Error Bounds for Nonnegative Matrix Factorization Under a Geometric Assumption”, *IEEE Conference on Acoustics, Speech and Signal Processing*, New Orleans, Louisiana, 2017
- C22. Renbo Zhao and Vincent Y. F. Tan, “A Unified Convergence Analysis of the Multiplicative Update Algorithm for Regularized NMF with General Divergences”, *IEEE Conference on Acoustics, Speech and Signal Processing*, New Orleans, Louisiana, 2017
- C23. Jiachun Liao, Lalitha Sankar, Vincent Y. F. Tan, and Flavio du Pin Calmon, “Hypothesis Testing in the High Privacy Limit”, *54th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2016
- C24. Lan V. Truong, Silas L. Fong, Vincent Y. F. Tan, “The ε -Capacity Region of AWGN Multiple Access Channels with Feedback”, *International Conference on Signal Processing and Communications*, Bangalore, India, 2016
- C25. Jiachun Liao, Lalitha Sankar, Vincent Y. F. Tan, and Flavio du Pin Calmon, “Hypothesis Testing in the High Privacy Limit”, *International Conference on Signal Processing and Communications*, Bangalore, India, 2016
- C26. Lin Zhou, Vincent Y. F. Tan and Mehul Motani, “Second-Order and Moderate Deviation Asymptotics for Successive Refinement”, *IEEE International Symposium on Information Theory*, Barcelona Spain, 2016

- C27. Lin Zhou, [Vincent Y. F. Tan](#) and Mehul Motani, “Discrete Lossy Gray-Wyner Revisited: Second-Order Asymptotics, Large and Moderate Deviations”, *IEEE International Symposium on Information Theory*, Barcelona Spain, 2016
- C28. Jonathan Scarlett, [Vincent Y. F. Tan](#) and Giuseppe Durisi, “The Dispersion of Nearest-Neighbor Decoding for Additive Non-Gaussian Channels”, *IEEE International Symposium on Information Theory*, Barcelona Spain, 2016
- C29. Silas L. Fong and [Vincent Y. F. Tan](#), “A Proof of the Strong Converse Theorem for Gaussian Broadcast Channels via the Gaussian Poincare Inequality”, *IEEE International Symposium on Information Theory*, Barcelona Spain, 2016
- C30. Si-Hyeon Lee, [Vincent Y. F. Tan](#) and Ashish Khisti, “Streaming Data Transmission in the Moderate Deviations and Central Limit Regimes”, *IEEE International Symposium on Information Theory*, Barcelona Spain, 2016
- C31. Masahito Hayashi and [Vincent Y. F. Tan](#), “Remaining Uncertainties and Exponents under Various Rényi Information Measures”, *IEEE International Symposium on Information Theory*, Barcelona Spain, 2016
- C32. Lan V. Truong, Silas L. Fong, and [Vincent Y. F. Tan](#), “On Second-Order Asymptotics for the AWGN Channel under an Expected Power Constraint”, *IEEE International Symposium on Information Theory*, Barcelona Spain, 2016
- C33. Silas L. Fong, [Vincent Y. F. Tan](#) and Jing Yang, “Non-Asymptotic Achievable Rates for Energy-Harvesting Channels using Save-and-Transmit”, *IEEE International Symposium on Information Theory*, Barcelona Spain, 2016
- C34. Silas L. Fong and [Vincent Y. F. Tan](#), “Two Applications of the Gaussian Poincare Inequality in the Shannon Theory”, *International Zurich Seminar on Communications (IZS)*, Zurich, Switzerland, Mar 2016
- C35. Jonathan Scarlett, [Vincent Y. F. Tan](#) and Giuseppe Durisi, “The Dispersion of Nearest-Neighbor Decoding for Additive Non-Gaussian Channels”, *International Zurich Seminar on Communications (IZS)*, Zurich, Switzerland, Mar 2016
- C36. Renbo Zhao and [Vincent Y. F. Tan](#), “Online Non-Negative Matrix Factorization with Outliers,” *IEEE Conference on Acoustics, Speech and Signal Processing*, Shanghai, China, 2016
- C37. Changho Suh, [Vincent Y. F. Tan](#) and Renbo Zhao, “Adversarial Top-K Ranking”, *Information Theory and Applications Workshop*, San Diego, C.A., 2016
- C38. Yanina Shkel, [Vincent Y. F. Tan](#) and Stark C. Draper, “Second-Order Coding Rates for m -Class Source-Channel Codes,” *53rd Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2015
- C39. Silas L. Fong and [Vincent Y. F. Tan](#), “A Proof of the Strong Converse Theorem for Gaussian Multiple Access Channels,” *IEEE Information Theory Workshop*, Jeju Island, S. Korea, 2015
- C40. [Vincent Y. F. Tan](#), “Error and Erasure Exponents for the Asymmetric Broadcast Channel,” *IEEE Information Theory Workshop*, Jeju Island, S. Korea, 2015
- C41. Masahito Hayashi and [Vincent Y. F. Tan](#), “Equivocations and Exponents under various Rényi Information Measures,” *IEEE International Symposium on Information Theory*, Hong Kong, 2015
- C42. Masahito Hayashi and [Vincent Y. F. Tan](#), “Error and Undetected Error Probabilities in the Moderate Deviations Regime,” *IEEE International Symposium on Information Theory*, Hong Kong, 2015
- C43. Silas L. Fong and [Vincent Y. F. Tan](#), “Strong Converse Theorems for Classes of Multimesage Multicast Networks: A Rényi Divergence Approach,” *IEEE International Symposium on Information Theory*, Hong Kong, 2015
- C44. Silas L. Fong and [Vincent Y. F. Tan](#), “Asymptotic Expansions for Gaussian Channels with Feedback under a Peak Power Constraint,” *IEEE International Symposium on Information Theory*, Hong Kong, 2015
- C45. Jonathan Scarlett and [Vincent Y. F. Tan](#), “Second-Order Asymptotics for the Discrete Memoryless MAC with Degraded Message Sets,” *IEEE International Symposium on Information Theory*, Hong Kong, 2015

- C46. Vincent Y. F. Tan and Matthieu Bloch, “Information Spectrum Approach to Strong Converse Theorems for Degraded Wiretap Channels,” *52nd Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2014
- C47. Jonathan Scarlett and Vincent Y. F. Tan, “Second-Order Asymptotics for the Gaussian MAC with Degraded Message Sets,” *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014
- C48. Sy-Quoc Le, Vincent Y. F. Tan and Mehul Motani, “Second-Order Asymptotics for the Gaussian Interference Channel with Strictly Very Strong Interference,” *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014
- C49. Yanina Shkel, Vincent Y. F. Tan and Stark C. Draper, “Achievability Bounds for Unequal Message Protection at Finite Block Lengths,” *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014
- C50. Yanina Shkel, Vincent Y. F. Tan and Stark C. Draper, “On Mismatched Unequal Message Protection for Finite Block Length Joint Source-Channel Coding,” *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014
- C51. Marco Tomamichel and Vincent Y. F. Tan, “Second Order Refinements to the Classical Capacities of Quantum Channels for Separable Input States,” *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014
- C52. Vincent Y. F. Tan and Marco Tomamichel, “The Third-Order Term in the Normal Approximation for the AWGN Channel,” *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014
- C53. Vincent Y. F. Tan, Shun Watanabe and Masahito Hayashi, “Moderate Deviations for Joint Source-Channel Coding for Systems with Markovian Memory,” *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014
- C54. Vincent Y. F. Tan and Pierre Moulin, “Second-Order Capacities for Erasure and List Decoding,” *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014
- C55. Vincent Y. F. Tan and George K. Atia, “Strong Impossibility Results for Noisy Group Testing,” *IEEE Conference on Acoustics, Speech and Signal Processing*, Florence, Italy, 2014
- C56. Jonathan Scarlett, Vincent Y. F. Tan, “Second-Order Asymptotics for the Gaussian MAC with Degraded Message Sets,” *Information Theory and Applications Workshop*, San Diego, C.A., 2014
- C57. Yanina Shkel, Vincent Y. F. Tan and Stark C. Draper, “Assorted Codes in the Finite Block-length Regime,” *Information Theory and Applications Workshop*, San Diego, C.A., 2014
- C58. John Z. F. Pang, Hong Cao and Vincent Y. F. Tan, “MOGT: Oversampling with a Parsimonious Mixture of Gaussian Trees Model for Imbalanced Time-Series Classification,” *IEEE International Workshop on Machine Learning for Signal Processing*, Southampton, U.K., 2013
- C59. Marco Tomamichel and Vincent Y. F. Tan, “ ε -Capacity and Strong Converse for Channels with General State,” *IEEE Information Theory Workshop*, Seville, Spain, 2013
- C60. Marco Tomamichel and Vincent Y. F. Tan, “A Tight Upper Bound for the Third-Order Asymptotics of Discrete Memoryless Channels,” *IEEE International Symposium on Information Theory*, Istanbul, Turkey, 2013
- C61. Shun Watanabe, Shigeaki Kuzuoka and Vincent Y. F. Tan, “Non-Asymptotic and Second-Order Achievability Bounds for Source Coding With Side-Information,” *IEEE International Symposium on Information Theory*, Istanbul, Turkey, 2013
- C62. Vincent Y. F. Tan, “A Formula for the Capacity of the General Gelfand-Pinsker Channel,” *IEEE International Symposium on Information Theory*, Istanbul, Turkey, 2013
- C63. Vincent Y. F. Tan, “Error Exponents for the Relay Channel,” *IEEE International Symposium on Information Theory*, Istanbul, Turkey, 2013
- C64. Yanina Shkel, Vincent Y. F. Tan and Stark C. Draper, “Converse Bounds for Assorted Codes in the Finite Blocklength Regime,” *IEEE International Symposium on Information Theory*, Istanbul, Turkey, 2013
- C65. Sy-Quoc Le, Vincent Y. F. Tan and Mehul Motani, “On the Dispersions of the Discrete Memoryless Interference Channel,” *IEEE International Symposium on Information Theory*, Istanbul, Turkey, 2013

- C66. Gang Yang, Vincent Y. F. Tan, Chin Keong Ho, See Ho Ting and Yong Liang Guan, “Wireless Compressive Sensing for Energy Harvesting Sensor Nodes over Fading Channels,” *IEEE International Conference on Communications*, Budapest, Hungary, 2013
- C67. Sy-Quoc Le, Vincent Y. F. Tan and Mehul Motani, “On the Dispersions of the Discrete Memoryless Interference Channel,” *Information Theory and Applications Workshop*, San Diego, CA, 2013
- C68. Vincent Y. F. Tan, “Transmission of Correlated Sources over a MAC: A Gaussian Approximation-Based Analysis,” *50th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2012
- C69. Vincent Y. F. Tan, “Achievable Second-Order Coding Rates for the Wiretap Channel,” *IEEE International Conference on Communication Systems*, Singapore, 2012
- C70. Vincent Y. F. Tan and Oliver Kosut, “The Dispersion of Slepian-Wolf Coding,” *IEEE International Symposium on Information Theory*, Cambridge, MA, 2012
- C71. Vincent Y. F. Tan, “Moderate-Deviations for Lossy Source Coding of Discrete and Gaussian Sources,” *IEEE International Symposium on Information Theory*, Cambridge, MA, 2012
- C72. Vincent Y. F. Tan and Oliver Kosut, “On the Dispersions of Three Network Information Theory Problems,” *Conference on Information Sciences and Systems*, Princeton, NJ, 2012
- C73. Vincent Y. F. Tan and Oliver Kosut, “The Dispersion of Slepian-Wolf Coding,” *Information Theory and Applications Workshop*, San Diego, CA, 2012
- C74. Vincent Y. F. Tan and Alan S. Willsky, “Sample Complexity for Topology Estimation in Networks of LTI Systems,” *IEEE Conference on Decision and Control*, Orlando, FL, 2011
- C75. Vincent Y. F. Tan and Cédric Févotte, “Automatic Relevance Determination in Nonnegative Matrix Factorization with the β -Divergence,” *Neural Information Processing Systems (NIPS) Workshop on Sparse Representation and Low-rank Approximation*, Granada, Spain, 2011
- C76. Animashree Anandkumar, Vincent Y. F. Tan, and Alan S. Willsky, “High-Dimensional Graphical Model Selection: Tractable Graph Families and Necessary Conditions,” *Neural Information Processing Systems*, Granada, Spain, 2011
- C77. Mesrob I. Ohannessian, Vincent Y. F. Tan and Munther A. Dahleh, “Canonical Estimation in a Rare Events Regime,” *49th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2011
- C78. Tzu-Han Chou, Vincent Y. F. Tan and Stark C. Draper, “The Sender-Excited Secret-Key Agreement Model: Capacity Theorems,” *49th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2011
- C79. Animashree Anandkumar, Vincent Y. F. Tan, and Alan S. Willsky, “Structure Estimation of Graphical Models Using Local Algorithms,” *49th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2011
- C80. Donatello Materassi and Vincent Y. F. Tan, “Reconstruction of Polytrees Networks of Dynamical Systems with Latent Nodes,” *49th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2011
- C81. Vincent Y. F. Tan and Alan S. Willsky, “Sample Complexity for Topology Estimation in Networks of LTI Systems,” *IFAC World Congress*, Milan, Italy, 2011
- C82. Vincent Y. F. Tan, Laura Balzano and Stark C. Draper, “Rank Minimization over Finite Fields,” *IEEE International Symposium on Information Theory*, St Petersburg, Russia, 2011
- C83. Animashree Anandkumar, Vincent Y. F. Tan, and Alan S. Willsky, “Structure Learning of Ising Models on Random Graphs,” *Information Theory and Applications Workshop*, San Diego, CA, 2011
- C84. Animashree Anandkumar, Vincent Y. F. Tan, and Alan S. Willsky, “High-Dimensional Robust Structure Learning of Ising Models on Sparse Random Graphs,” *NIPS Workshop on Robust Statistical Learning*, Vancouver, BC, 2010
- C85. Myung Jin Choi, Vincent Y. F. Tan, Animashree Anandkumar and Alan S. Willsky, “Consistent and Efficient Reconstruction of Latent Tree Models,” *48th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2010

- C86. Vincent Y. F. Tan, Animashree Anandkumar and Alan S. Willsky, "Scaling Laws for Learning High-Dimensional Markov Forest Distributions," *48th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2010
- C87. Vincent Y. F. Tan, Matt Johnson and Alan S. Willsky, "Necessary and Sufficient Conditions for High-Dimensional Salient Feature Subset Recovery," *IEEE International Symposium on Information Theory*, Austin, TX, 2010
- C88. Vincent Y. F. Tan, Animashree Anandkumar and Alan S. Willsky, "Error Exponents for Composite Hypothesis Testing of Markov Forest Distributions," *IEEE International Symposium on Information Theory*, Austin, TX, 2010
- C89. Jonathan Carlson, Nico Pfeifer, Tien-Ho Lin, Vincent Y. F. Tan, Eric Lantz and David Heckerman "Inference of Phylogenies Under Covariation and Selection2," *17th International Conference on HIV Dynamics and Evolution*, 2010
- C90. Vincent Y. F. Tan, Animashree Anandkumar and Alan S. Willsky, "How do the Structure and Parameters of Gaussian Tree Models Affect Structure Learning?," *47th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, 2009
- C91. Vincent Y. F. Tan, Animashree Anandkumar, Lang Tong and Alan S. Willsky, "A Large-Deviations Analysis for the Maximum-Likelihood Learning of Tree Structures," *IEEE International Symposium on Information Theory*, Seoul, Korea, 2009
- C92. Vincent Y. F. Tan and Vivek K. Goyal, "Estimating Signals with Finite Rate of Innovation from Noisy Samples: A Stochastic Algorithm," *Sampling Theory and Applications*, Marseille, France, 2009
- C93. Vincent Y. F. Tan and Cédric Févotte, "Automatic Relevance Determination in Nonnegative Matrix Factorization," *Signal Processing with Adaptive Sparse Structured Representations Workshop*, St Malo, France, 2009
- C94. Vincent Y. F. Tan, John Winn, Angela Simpson and Adnan Custovic, "Immune System Modeling using Infer.NET," *IEEE Conference on e-Science*, Indianapolis, IN, 2008
- C95. Vincent Y. F. Tan, John W. Fisher III and Alan S. Willsky, "Learning Max-Weight Discriminative Forests," *IEEE Conference on Acoustics, Speech and Signal Processing*, Las Vegas, NV, 2008
- C96. Vincent Y. F. Tan, John W. Fisher III and Alan S. Willsky, "Learning Max-Weight Discriminative Forests," *Information Theory and Applications Workshop*, San Diego, CA, 2008
- C97. Sujay Sanghavi, Vincent Y. F. Tan and Alan S. Willsky, "Learning Graphical Models for Hypothesis Testing," *IEEE Statistical Signal Processing Workshop*, Madison, WI, 2007
- C98. Vincent Y. F. Tan and See-Kiong Ng, "Privacy-Preserving Sharing of Horizontally-Distributed Private Data for Constructing Accurate Classifiers," *PinKDD 2007: ACM SIGKDD Workshop on Privacy, Security and Trust in KDD*, San Jose, CA, 2007
- C99. Vincent Y. F. Tan and See-Kiong Ng, "Generic Probability Density Function Reconstruction for Randomization in Privacy-Preserving Data Mining," *Machine Learning and Data Mining Conference*, Leipzig, Germany, 2007
- C100. Vincent Y. F. Tan and Cédric Févotte, "A Study of the Effect of Source Sparsity for Various Transforms on Blind Audio Source Separation Performance," *Signal Processing with Adaptive Sparse Structured Representations Workshop*, Rennes, France, 2005