Jonathan Scarlett

Curriculum Vitae

PERSONAL DETAILS

Contact Address:

National University of Singapore School of Computing (Office COM3-02-57) 13 Computing Drive, Singapore 117417 Phone: +65 6516 1179 Email: scarlett@comp.nus.edu.sg

RESEARCH INTERESTS

I am interested in theoretical and algorithmic aspects of statistical inference, learning, and optimization, with a particular emphasis on information-theoretic methods. Further information can be found at https://www.comp.nus.edu.sg/~scarlett/research.html.

EDUCATION

 Ph.D.
 October 2011 – August 2014

 University of Cambridge, Information Engineering Division
 Thesis title: Reliable Communication Under Mismatched Decoding

B. Eng. / B. Sci.

University of Melbourne Majored in Electrical Engineering and Computer Science March 2006 – November 2010

EMPLOYMENT HISTORY

National University of Singapore

Associate Professor (since 2024) Assistant Professor (2018–2023)

Departments: Joint appointment, Computer Science & Mathematics

École Polyte	echnique Fédérale de Lausanne (EPFL)	September 2014 – September 2017
Post-doctoral	Fellow	
Group:	Laboratory for Information and Inference Systems (LIONS)	
Topic:	Machine learning (high-dimensional statistics, or	line optimization)
Supervisor:	Volkan Cevher	

University of Cambridge

Research and Teaching AssistantGroup:Signal Processing and CommunicationsTopic:Information theory (mismatched decoding, non-asymptotic performance)Supervisor:Albert Guillén i Fàbregas

January 2018 – Present

October 2011 – August 2014

FUNDING

AI Visiti	ing Professorship	Nov. 2024 – Nov. 2027
Title: Amount:	Adaptive and resource-efficient sequential decision-making al SGD 2.87M (w/ Kevin Jamieson, University of Washington)	gorithms
NUS Pro	esidential Young Professorship	Oct. 2024 – Oct. 2029
Title: Amount:	Statistical estimation and learning with 1-bit feedback ${\rm SGD320k}$	
MoE Ac	ademic Research Fund (AcRF) Tier 1	March 2023 – March 2026
Title: Amount:	Safety and reliability in black-box optimization SGD 250k	
Singapor	e National Research Foundation (NRF) Fellowship	May 2019 – May 2024
Title: Amount:	Robust statistical learning under model uncertainty ${ m SGD}2.3{ m M}$	
NUS Early Career Research Award Nov. 2018 – Nov. 2022		
Title:	Information-theoretic methods in data science	
Amount:	$\mathrm{SGD}500\mathrm{k}$	

TEACHING

National University of Singapore	
· CS5275 The Algorithm Designer's Toolkit	2025
· MA4254 Discrete Optimization	2024
· MA4270 Data Modeling and Computation	$2018{-}2020,\ 2022$
\cdot CS3236 Introduction to Information Theory	$2019,\ 2020,\ 2023,\ 2024$
\cdot CS5339 Theory and Algorithms for Machine Learning	2021
· CS6216 Advanced Topics in Machine Learning	2021
\cdot CS6235 Advanced Topics in Theoretical Computer Science	2023

AWARDS

· NUS CS Faculty Teaching Excellence Award	2022, 2025
\cdot Singapore AI Visiting Professorship award (w/ Kevin Jamieson)	2024
· NUS Presidential Young Professorship	2021
\cdot MIT Technology Review's Innovators Under 35 (Asia Pacific)	2021
\cdot Finalist for the ISIT student paper award	2014 (student), 2021 (advisor)
\cdot Top reviewer achievement, ICML (×3) & NeurIPS (×2), AISTATS	2018-2023
\cdot Singapore National Research Foundation (NRF) Fellowship	2019
\cdot NUS Early Career Research Award	2018
\cdot EPFL Fellows postdoctoral award co-funded by Marie Skłodowska-	Curie 2015
\cdot Poynton Cambridge Australia International Scholarship	2011
\cdot Top student in Electrical Engineering, University of Melbourne	2010

PROFESSIONAL ACTIVITIES

Roles in University	
\cdot Assistant Dean for Graduate Studies, School of Computing, NUS	July 2024 – Present
\cdot Faculty Research Committee, School of Computing, NUS	July 2024 – Present
\cdot Assistant Director of PhD Program, Institute for Data Science, NUS	2021 - 2023

Roles in Research Community

- Conference organizing committees: ICML (publications), ITW (publicity), ALT (local), ISIT (student travel grants)
- $\cdot\,$ Senior Area Chair for NeurIPS 2024
- · Area Chair (or equivalent) in machine learning conferences: NeurIPS, ICML, ICLR, COLT, ALT, AAAI, IJCAI
- $\cdot\,$ Technical Program Committee in information theory conferences: ISIT, ITW, Beyond IID
- \cdot Journal editorial roles: IEEE T-IT, IEEE JSAIT, TMLR

Tutorial Presentations

\cdot Annual Graduate School in Mathematical Aspects of Data Science	
\cdot ICASSP tutorial (group testing and its application to COVID-19 testin	ng) 2021
\cdot Croucher Summer Course on Information Theory (info. theory & statis	tical learning) 2019
Selected Invited Talks	
\cdot Workshop on High Dimensional Data Analysis	2024
\cdot IMS Workshop on Mathematics of Data	2024
\cdot Workshop in IEEE Conference on Decision and Control	2023
\cdot Information Theory in Singapore Workshop	2023
\cdot One World MINDS (online seminar)	2021
\cdot MIT (online seminar)	2021
\cdot Goethe University Frankfurt (online seminar)	2021
\cdot International Conference on Signal Processing and Communications	2020
\cdot London Symposium on Information Theory	2019
\cdot Information Theory and Applications Workshop	2014,2015,2017,2019

(Publications are shown on the following pages.)

Monographs and Book Chapters

- [B3] Matthew Aldridge, Oliver Johnson, and Jonathan Scarlett, "Group testing: An information theory perspective," Foundations and Trends in Communications and Information Theory, Volume 15, Issue 3-4, pp. 196-392, Dec. 2019.
- [B2] Jonathan Scarlett, Albert Guillén i Fàbregas, Anelia Somekh-Baruch, and Alfonso Martinez, "Information-theoretic foundations of mismatched decoding", *Foundations and Trends in Communications and Information Theory*, Volume 17, Issue 2-3, pp. 149-400, Aug. 2020.
- [B1] Jonathan Scarlett and Volkan Cevher, "An introductory guide to Fano's inequality with applications in statistical estimation," book chapter in *Information-Theoretic Methods in Data Science* (Rodrigues/Eldar), Cambridge University Press, 2021.

Patents

[P1] Volkan Cevher, Yen-Huan Li, Luca Baldassarre, Jonathan Scarlett, Ilija Bogunovic, and Baran Gözcü, "Learning-based subsampling," US-14/887,295.

Journal Papers

- [J45] Recep Can Yavas, Yuqi Huang, Vincent Y. F. Tan, Jonathan Scarlett, "A general framework for clustering and distribution matching with bandit feedback," *IEEE Transactions on Information Theory*, Volume 71, Issue 3, pp. 2116-2139, March 2025.
- [J44] Yan Hao Ling and Jonathan Scarlett, "Optimal 1-bit error exponent for 2-hop relaying with binary-input channels," *IEEE Transactions on Information Theory*, Volume 70, Issue 11, pp. 7599-7615, Nov. 2024.
- [J43] Nelvin Tan, Pablo Pascual Cobo, Jonathan Scarlett, and Ramji Venkataramanan, "Approximate message passing with rigorous guarantees for pooled data and quantitative group testing," *SIAM Journal on Mathematics of Data Science* (SIMODS), Volume 6, Issue 4, pp. 1027-1054, 2024.
- [J42] Thach V. Bui and Jonathan Scarlett, "Concomitant group testing," IEEE Transactions on Information Theory, Volume 70, Issue 10, pp. 7179-7192, Oct. 2024.
- [J41] Yan Hao Ling and Jonathan Scarlett, "Maxflow-based bounds for low-rate information propagation over noisy networks," *IEEE Transactions on Information Theory*, Volume 70, Issue 6, pp. 3840-3854, June 2024.
- [J40] Zihan Li and Jonathan Scarlett, "Regret Bounds for Noise-Free Cascaded Kernelized Bandits," Transactions on Machine Learning Research (TMLR), May 2024.
- [J39] Millen Kanabar and Jonathan Scarlett "Mismatched rate-distortion theory: Ensembles, bounds, and general alphabets," *IEEE Transactions on Information Theory*, Volume 70, Issue 3, pp. 1525-1539, March 2024.
- [J38] Xu Cai, Chi Thanh Lam, Jonathan Scarlett, "On average-case error bounds for kernel-based Bayesian quadrature," Transactions on Machine Learning Research (TMLR), July 2023.
- [J37] Thach V. Bui and Jonathan Scarlett, "Non-adaptive algorithms for threshold group testing with consecutive positives," *Information and Inference: A Journal of the IMA*, Volume 12, Issue 3, article iaad009, Sept. 2023.
- [J36] Yan Hao Ling and Jonathan Scarlett, "Multi-bit relaying over a tandem of channels," IEEE Transactions on Information Theory, Volume 69, Issue 6, pp. 3511-3524, June 2023.
- [J35] Eric Price, Jonathan Scarlett, and Nelvin Tan "Fast splitting algorithms for sparsity-constrained and noisy group testing," *Information and Inference: A Journal of the IMA*, Volume 12, Issue 2, pp. 1141-1171, June 2023.
- [J34] Nelvin Tan, Way Tan, and Jonathan Scarlett, "Performance bounds for group testing With doubly-regular designs," *IEEE Transactions on Information Theory*, Volume 69, Issue 2, pp. 1224-1243, Feb. 2023.

- [J33] Ivan Lau, Jonathan Scarlett, and Sun Yang "Model-based and graph-based priors for group testing", *IEEE Transactions on Signal Processing*, Volume 70, pp. 6035-6050, Dec. 2022.
- [J32] Yan Hao Ling and Jonathan Scarlett, "Simple coding techniques for many-hop relaying," IEEE Transactions on Information Theory, Volume 68, Issue 11, pp. 7043-7053, Nov. 2022.
- [J31] Jonathan Scarlett, Reinhard Heckel, Miguel R. D. Rodrigues, Paul Hand, and Yonina C. Eldar, "Theoretical perspectives on deep learning methods in inverse problems," *IEEE Journal on Selected Areas in Information Theory*, Volume 3, Issue 3, pp. 433-453, Sept. 2022.
- [J30] Wei Heng Bay, Eric Price, and Jonathan Scarlett, "Optimal non-adaptive probabilistic group testing in general sparsity regimes," *Information and Inference: A Journal of the IMA*, Volume 11, Issue 3, pp. 1037–1053, Sept. 2022.
- [J29] Oliver Gebhard, Max Hahn-Klimroth, Olaf Parczyk, Manuel Penschuck, Maurice Rolvien, Jonathan Scarlett, and Nelvin Tan, "Near optimal sparsity-constrained group testing: Improved bounds and algorithms," *IEEE Transactions on Information Theory*, Volume 68, Issue 5, pp. 3253-3280, May 2022.
- [J28] Bernard Teo and Jonathan Scarlett, "Noisy adaptive group testing via noisy binary search," *IEEE Transactions on Information Theory*, Volume 68, Issue 5, pp. 3340-3353, May 2022.
- [J27] Zexin Wang, Vincent Tan, and Jonathan Scarlett, "Tight regret bounds for noisy optimization of a Brownian motion", *IEEE Transactions on Signal Processing*, Volume 70, pp. 1072-1087, Jan. 2022
- [J26] Yan Hao Ling and Jonathan Scarlett, "Optimal rates of teaching and learning under uncertainty," *IEEE Transactions on Information Theory*, Volume 67, Issue 11, pp. 7067-7080, Nov. 2021.
- [J25] Yang Sun, Hangdong Zhao, and Jonathan Scarlett, "On architecture selection for linear inverse problems with untrained neural networks," *Entropy*, Volume 23, Issue 11, Article 1481, Nov. 2021.
- [J24] Steffen Bondorf, Binbin Chen, Jonathan Scarlett, Haifeng Yu, and Yuda Zhao, "Sublinear-time non-adaptive group testing with $O(k \log n)$ tests via bit-mixing coding," *IEEE Transactions on Information Theory*, Volume 67, Issue 3, pp. 1559-1570, March 2021.
- [J23] Lan V. Truong, Matthew Aldridge, and Jonathan Scarlett, "On the all-or-nothing behavior of Bernoulli group testing," *IEEE Journal on Selected Areas in Information Theory*, Volume 1, Issue 3, pp. 669-680, November 2020.
- [J22] Lan V. Truong and Jonathan Scarlett, "Support recovery in the phase retrieval model: Information theoretic fundamental limits," *IEEE Transactions on Information Theory*, Volume 66, Issue 12, pp. 7887-7910, December 2020.
- [J21] Lan V. Truong and Jonathan Scarlett, "On gap-based lower bounding techniques for best-arm identification," *Entropy*, Volume 22, Issue 7, Article 788, July 2020.
- [J20] Zhaoqiang Liu and Jonathan Scarlett, "Information-theoretic lower bounds for compressive sensing with generative models," *IEEE Journal on Selected Areas in Information Theory*, Volume 1, Issue 1, pp. 292-303, May 2020.
- [J19] Jonathan Scarlett and Oliver Johnson, "Noisy non-adaptive group testing: A (near-)definite defectives approach," *IEEE Transactions on Information Theory*, Volume 66, Issue 6, pp. 3775-3797, June 2020.
- [J18] Jonathan Scarlett, "Noisy adaptive group testing: Bounds and algorithms," IEEE Transactions on Information Theory, Volume 65, Issue 6, pp. 3646-3661, June 2019.
- [J17] Anelia Somekh-Baruch, Jonathan Scarlett, and Albert Guillén i Fàbregas, "Generalized random Gilbert-Varshamov codes," *IEEE Transactions on Information Theory*, Volume 65, Issue 6, pp. 3452-3469, June 2019.
- [J16] Oliver Johnson, Matthew Aldridge, and Jonathan Scarlett, "Performance of group testing algorithms with near-constant tests-per-item," *IEEE Transactions on Information Theory*, Volume 65, Issue 2, pp. 707-723, Feb. 2019.

- [J15] Jonathan Scarlett and Volkan Cevher, "Near-optimal noisy group testing via separate decoding of items," *IEEE Journal on Selected Topics in Signal Processing* (Special Issue on Information-Theoretic Methods in Data Acquisition, Analysis, and Processing), Volume 12, Issue 5, pp. 902-915, Oct. 2018.
- [J14] Baran Gözcü, Rabeeh Karimi Mahabadi, Yen-Huan Li, Efe Ilıcak, Tolga Çukur, Jonathan Scarlett, and Volkan Cevher, "Learning-based compressive MRI," *IEEE Transactions on Medical Imaging* (Special Issue on Machine Learning for Image Reconstruction), Volume 37, Issue 6, pp. 1394-1406, June 2018.
- [J13] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Mismatched multi-letter successive decoding for the multiple-access channel," *IEEE Transactions on Information The*ory, Volume 64, Issue 4, pp. 2253-2266, April 2018.
- [J12] Jonathan Scarlett and Volkan Cevher, "Limits on support recovery with probabilistic models: An information-theoretic framework," *IEEE Transactions on Information Theory*, Volume 63, Issue 1, pp. 593-620, Jan. 2017.
- [J11] Jonathan Scarlett, Vincent Tan, and Giuseppe Durisi, "The dispersion of nearest-neighbor decoding for additive non-Gaussian channels," *IEEE Transactions on Information Theory*, Volume 63, Issue 1, pp. 81-92, Jan. 2017.
- [J10] Jonathan Scarlett and Volkan Cevher, "On the difficulty of selecting Ising models with approximate recovery," *IEEE Transactions on Signal and Information Processing over Networks*, Volume 2, Issue 4, pp. 625-638, July 2016.
- [J9] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Multiuser random coding techniques for mismatched decoding," *IEEE Transactions on Information Theory*, Volume 62, Issue 7, pp. 3950-3970, July 2016.
- [J8] Luca Baldassarre, Yen-Huan Li, Jonathan Scarlett, Baran Gözcü, Ilija Bogunovic, and Volkan Cevher, "Learning-based compressive subsampling," *IEEE Journal on Selected Topics in Signal Processing (Special Issue on Structured Matrices in Signal and Data Processing)*, Volume 10, Issue 4, pp. 809-822, March 2016.
- [J7] Jonathan Scarlett and Vincent Tan, "Second-order asymptotics for the Gaussian MAC with degraded message sets," *IEEE Transactions on Information Theory*, Volume 61, Issue 12, pp. 6700-6718, Dec. 2015.
- [J6] Jonathan Scarlett, Anelia Somekh-Baruch, Alfonso Martinez, and Albert Guillén i Fàbregas, "A counter-example to the mismatched decoding converse for binary-input discrete memoryless channels," *IEEE Transactions on Information Theory*, Volume 61, Issue 10, pp. 5387-5395, Oct. 2015.
- [J5] Jonathan Scarlett, "On the dispersions of the Gel'fand-Pinsker channel and dirty paper coding," *IEEE Transactions on Information Theory*, Volume 61, Issue 9, pp. 4569-4586, Sept. 2015.
- [J4] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Second-order rate region of constant-composition codes for the multiple-access channel," *IEEE Transactions on Information Theory*, Volume 61, Issue 1, pp. 157-172, Jan. 2015.
- [J3] Jonathan Scarlett, Li Peng, Neri Merhav, Alfonso Martinez, and Albert Guillén i Fàbregas, "Expurgated random-coding ensembles: Exponents, refinements and connections," *IEEE Transactions on Information Theory*, Volume 60, Issue 8, pp. 4449-4462, Aug. 2014.
- [J2] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Mismatched decoding: Error exponents, second-order rates and saddlepoint approximations," *IEEE Transactions on Information Theory*, Volume 60, Issue 5, pp. 2647-2666, May 2014.
- [J1] Jonathan Scarlett, Jamie Evans, and Subhrakanti Dey, "Compressed sensing with prior information: Information-theoretic limits and practical decoders," *IEEE Transactions on Signal Processing*, Volume 61, Issue 2, pp. 427-439, Jan. 2013.

Conference Papers (Full Length)

- [C44] Xu Cai and Jonathan Scarlett, "Lower bounds for time-varying kernelized bandits," accepted to International Conference on Artificial Intelligence and Statistics (AISTATS), 2025.
- [C43] Ivan Lau and Jonathan Scarlett, "Quantile multi-armed bandits with 1-bit feedback," International Conference on Algorithmic Learning Theory (ALT), 2025.
- [C42] Junren Chen and Jonathan Scarlett, "Exact thresholds for noisy non-adaptive group testing," ACM-SIAM Symposium on Discrete Algorithms (SODA), 2025.
- [C41] Qianli Shen, Yezhen Wang, Zhouhao Yang, Xiang Li, Haonan Wang, Yang Zhang, Jonathan Scarlett, Zhanxing Zhu, and Kenji Kawaguchi, "Memory-efficient gradient unrolling for largescale bi-level optimization," *Conference on Neural Information Processing Systems* (NeurIPS), 2024.
- [C40] Zihan Li, Pasin Manurangsi, Jonathan Scarlett, and Warut Suksompong, "Complexity of round-robin allocation with potentially noisy queries," *International Symposium on Algorith*mic Game Theory (SAGT), 2024.
- [C39] Arpan Losalka and Jonathan Scarlett, "No-regret algorithms for safe Bayesian optimization with monotonicity constraints," *International Conference on Artificial Intelligence and Statis*tics (AISTATS), 2024.
- [C38] Xu Cai and Jonathan Scarlett, "Kernelized normalizing constant estimation: Bridging Bayesian quadrature and Bayesian optimization," AAAI Conference on Artificial Intelligence, 2024.
- [C37] Junren Chen, Jonathan Scarlett, Michael Ng, and Zhaoqiang Liu, "A unified framework for uniform signal recovery in nonlinear generative compressed sensing," *Conference on Neural Information Processing Systems* (NeurIPS), 2023.
- [C36] Arpan Losalka and Jonathan Scarlett, "Benefits of monotonicity in safe exploration with Gaussian processes," Conference on Uncertainty in Artificial Intelligence (UAI), 2023.
- [C35] Prathamesh Mayekar, Jonathan Scarlett, and Vincent Y.F. Tan, "Communication-constrained bandits under additive Gaussian noise," *International Conference on Machine Learning* (ICML), 2023.
- [C34] Ivan Lau, Yan Hao Ling, Mayank Shrivastava, and Jonathan Scarlett, "Max-quantile grouped infinite-arm bandits," *International Conference on Algorithmic Learning Theory* (ALT), 2023.
- [C33] Ilija Bogunovic, Zihan Li, Andreas Krause, and Jonathan Scarlett, "A robust phased elimination algorithm for corruption-tolerant Gaussian process bandits," Conference on Neural Information Processing Systems (NeurIPS), 2022.
- [C32] Eric Han and Jonathan Scarlett, "Adversarial attacks on Gaussian process bandits," International Conference on Machine Learning (ICML), 2022.
- [C31] Sattar Vakili, Jonathan Scarlett, Da-shan Shiu, and Alberto Bernacchia, "Improved convergence rates for sparse approximation methods in kernel-based learning," *International Confer*ence on Machine Learning (ICML), 2022.
- [C30] Zhaoqiang Liu, Jiulong Liu, Subhroshekhar Ghosh, Jun Han, and Jonathan Scarlett, "Generative principal component analysis," *International Conference on Learning Representations* (ICLR), 2022.
- [C29] Zihan Li and Jonathan Scarlett, "Gaussian process bandit optimization with few batches," International Conference on Artificial Intelligence and Statistics (AISTATS), 2022.
- [C28] Zhenlin Wang and Jonathan Scarlett, "Max-Min Grouped Bandits," AAAI Conference on Artificial Intelligence, 2022.
- [C27] Zhaoqiang Liu, Subhroshekhar Ghosh, and Jonathan Scarlett, "Towards sample-optimal compressive phase retrieval with sparse and generative priors," Conference on Neural Information Processing Systems (NeurIPS), 2021.
- [C26] Xu Cai and Jonathan Scarlett, "On lower bounds for standard and robust Gaussian process bandit optimization," *International Conference on Machine Learning* (ICML), 2021.
- [C25] Xu Cai, Selwyn Gomes, and Jonathan Scarlett, "Lenient regret and good-action identification in Gaussian process bandits," *International Conference on Machine Learning* (ICML), 2021.

- [C24] Ilija Bogunovic, Arpan Losalka, Andreas Krause, and Jonathan Scarlett, "Stochastic linear bandits robust to adversarial attacks," *International Conference on Artificial Intelligence and Statistics* (AISTATS), 2021.
- [C23] Eric Han, Ishank Arora, and Jonathan Scarlett, "High-dimensional Bayesian optimization via tree-structured additive models," AAAI Conference on Artificial Intelligence, 2021.
- [C22] Zhaoqiang Liu and Jonathan Scarlett, "The generalized Lasso with nonlinear observations and generative priors," *Conference on Neural Information Processing Systems* (NeurIPS), 2020.
- [C21] Eric Price and Jonathan Scarlett, "A fast binary splitting approach to non-adaptive group testing," International Conference on Randomization and Computation (RANDOM), 2020.
- [C20] Zhaoqiang Liu, Selwyn Gomes, Avtansh Tiwari, and Jonathan Scarlett, "Sample complexity bounds for 1-bit compressive sensing and binary stable embeddings with generative priors," *International Conference on Machine Learning* (ICML), 2020.
- [C19] Abdul Fatir Ansari, Jonathan Scarlett, and Harold Soh, "A characteristic function approach to deep implicit generative modeling," *Conference on Computer Vision and Pattern Recognition* (CVPR), 2020.
- [C18] Ilija Bogunovic, Andreas Krause, and Jonathan Scarlett, "Corruption-tolerant Gaussian process bandit optimization," *International Conference on Artificial Intelligence and Statistics* (AISTATS), 2020.
- [C17] Anamay Chaturvedi and Jonathan Scarlett, "Learning Gaussian graphical models via multiplicative weights," *International Conference on Artificial Intelligence and Statistics* (AIS-TATS), 2020.
- [C16] Bishwamittra Ghosh, Lorenzo Ciampiconi, Jonathan Scarlett, and Kuldeep Meel, "A MaxSATbased framework for group testing," AAAI Conference on Artificial Intelligence, 2020.
- [C15] Zihan Li, Matthias Fresacher, and Jonathan Scarlett, "Learning Erdős-Rényi random graphs via edge detecting queries," Conference on Neural Information Processing Systems (NeurIPS), 2019.
- [C14] Steffen Bondorf, Binbin Chen, Jonathan Scarlett, Haifeng Yu, and Yuda Zhao, "Cross-sender bit-mixing coding," Conference on Information Processing in Sensor Networks (IPSN), 2019.
- [C13] Ilija Bogunovic, Jonathan Scarlett, Stefanie Jegelka, and Volkan Cevher, "Adversarially robust optimization with Gaussian processes," Conference on Neural Information Processing Systems (NeurIPS), 2018. (Spotlight presentation)
- [C12] Jonathan Scarlett, "Tight regret bounds for Bayesian optimization in one dimension," International Conference on Machine Learning (ICML), 2018.
- [C11] Paul Rolland, Jonathan Scarlett, Ilija Bogunovic, and Volkan Cevher, "High-dimensional Bayesian optimization via additive models with overlapping groups," *International Confer*ence on Artificial Intelligence and Statistics (AISTATS), 2018.
- [C10] Jonathan Scarlett and Volkan Cevher, "Phase transitions in the pooled data problem," Conference on Neural Information Processing Systems (NeurIPS), 2017
- [C9] Ilija Bogunovic, Slobodan Mitrović, Jonathan Scarlett, and Volkan Cevher, "Robust submodular maximization: A non-uniform partitioning approach," *International Conference on Machine Learning* (ICML), 2017.
- [C8] Volkan Cevher, Michael Kapralov, Jonathan Scarlett, and Amir Zandieh (alphabetical), "An adaptive sublinear-time block sparse Fourier transform," ACM Symposium on Theory of Computing (STOC), 2017.
- [C7] Jonathan Scarlett, Ilija Bogunovic, and Volkan Cevher, "Lower bounds on regret for noisy Gaussian process bandit optimization," Conference on Learning Theory (COLT), 2017.
- [C6] Jonathan Scarlett and Volkan Cevher, "Lower bounds on active learning for graphical model selection," International Conference on Artificial Intelligence and Statistics (AISTATS), 2017.
- [C5] Ilija Bogunovic, Jonathan Scarlett, Andreas Krause, and Volkan Cevher, "Truncated variance reduction: A unified approach to Bayesian optimization and level-set estimation", *Conference* on Neural Information Processing Systems (NeurIPS), 2016.

- [C4] Jonathan Scarlett and Volkan Cevher, "Limits on sparse support recovery via linear sketching with random expander matrices," *International Conference on Artificial Intelligence and Statistics* (AISTATS), 2016.
- [C3] Ilija Bogunovic, Jonathan Scarlett, and Volkan Cevher, "Time-varying Gaussian process bandit optimization," International Conference on Artificial Intelligence and Statistics (AISTATS), 2016.
- [C2] Jonathan Scarlett and Volkan Cevher, "Phase transitions in group testing," ACM-SIAM Symposium on Discrete Algorithms (SODA), 2016.
- [C1] Yen-Huan Li, Jonathan Scarlett, Pradeep Ravikumar, and Volkan Cevher, "Sparsistency of l₁-regularized M-estimators," International Conference on Artificial Intelligence and Statistics (AISTATS), 2015. (Oral presentation)

Conference Papers (Other)

- [O46] Yan Hao Ling and Jonathan Scarlett, "Exact error exponents for a concatenated coding based class of DNA storage codes," *IEEE International Symposium on Information Theory* (ISIT), 2024.
- [O45] Jonathan Scarlett, Nicholes Teh, and Yair Zick, "For one and all: Individual and group fairness in the allocation of indivisible goods," *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS) [Extended Abstract], 2023.
- [O44] Yan Hao Ling and Jonathan Scarlett, "A simple coding scheme attaining positive information velocity," *IEEE International Symposium on Information Theory* (ISIT), 2022.
- [O43] Millen Kanabar and Jonathan Scarlett, "Multi-user random coding techniques for mismatched rate-distortion theory," *IEEE International Symposium on Information Theory* (ISIT), 2022.
- [O42] Thach V. Bui, Yeow Meng Chee, Jonathan Scarlett, and Van Khu Vu, "Group testing with blocks of positives," *IEEE International Symposium on Information Theory* (ISIT), 2022.
- [O41] Sidhant Bansal, Arnab Bhattacharyya, Anamay Chaturvedi, and Jonathan Scarlett, "Universal 1-bit compressive sensing for bounded dynamic range signals," *IEEE International Symposium* on Information Theory (ISIT), 2022.
- [O40] Yang Sun and Jonathan Scarlett, "Data-driven algorithms for Gaussian measurement matrix design in compressive sensing," *IEEE I nternational Conference on Acoustics, Speech, and Sig*nal Processing (ICASSP), 2022.
- [O39] Zhaoqiang Liu, Subhroshekhar Ghosh, and Jonathan Scarlett, "Robust 1-bit compressive sensing with partial Gaussian circulant matrices and generative priors," IEEE Information Theory Workshop (ITW), 2021.
- [O38] Yan Hao Ling and Jonathan Scarlett, "Optimal rates of teaching and learning under binary symmetric noise," *IEEE International Symposium on Information Theory* (ISIT), 2021. (Finalist for the student paper award)
- [O37] Nelvin Tan and Jonathan Scarlett, "An analysis of the DD algorithm for group testing with size-constrained tests," *IEEE International Symposium on Information Theory* (ISIT), 2021.
- [O36] Nelvin Tan and Jonathan Scarlett, "Near-optimal sparse adaptive group testing," IEEE International Symposium on Information Theory (ISIT), 2020.
- [O35] Zhaoqiang Liu and Jonathan Scarlett, "Sample complexity lower bounds for compressive sensing with generative models," *International Conference on Signal Processing and Communica*tions (SPCOM), 2020. (Invited)
- [O34] Lan V. Truong and Jonathan Scarlett, "On the information-theoretic limits of noisy sparse phase retrieval," *IEEE Information Theory Workshop* (ITW), 2019.
- [O33] Jonathan Scarlett, "An efficient algorithm for capacity-approaching noisy adaptive group testing," *IEEE International Symposium on Information Theory* (ISIT), 2019.

- [O32] Ilija Bogunovic, Jonathan Scarlett, and Volkan Cevher, "Overlapping multi-bandit best arm identification," *IEEE International Symposium on Information Theory* (ISIT), 2019.
- [O31] Anelia Somekh-Baruch, Jonathan Scarlett, and Albert Guillén i Fàbregas, "A recursive costconstrained construction that attains the expurgated exponent," *IEEE International Sympo*sium on Information Theory (ISIT), 2019.
- [O30] Jonathan Scarlett and Volkan Cevher, "Near-optimal noisy group testing via separate decoding of items," *IEEE International Symposium on Information Theory* (ISIT), 2018.
- [O29] Anelia Somekh-Baruch, Jonathan Scarlett, and Albert Guillén i Fàbregas, "The error exponent of generalized random Gilbert-Varshamov codes," *IEEE International Symposium on Informa*tion Theory (ISIT), 2018.
- [O28] Ilija Bogunovic, Slobodan Mitrović, Jonathan Scarlett, and Volkan Cevher, "A distributed algorithm for partitioned robust submodular maximization," *IEEE International Workshop* on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), 2017.
- [O27] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Expurgated joint sourcechannel coding bounds and error exponents," *IEEE International Symposium on Information Theory* (ISIT), 2017.
- [O26] Jonathan Scarlett and Volkan Cevher, "How little does non-exact recovery help in group testing?," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2017. (Invited)
- [O25] Jonathan Scarlett and Volkan Cevher, "Converse bounds for noisy group testing with arbitrary measurement matrices," *IEEE International Symposium on Information Theory* (ISIT), 2016.
- [O24] Jonathan Scarlett and Volkan Cevher, "Partial recovery bounds for the sparse stochastic block model," *IEEE International Symposium on Information Theory* (ISIT), 2016.
- [O23] Matthew Aldridge, Oliver Johnson, and Jonathan Scarlett, "Improved group testing rates with constant column weight designs," *IEEE International Symposium on Information Theory* (ISIT), 2016.
- [O22] Daniel Fehr, Jonathan Scarlett, and Alfonso Martinez, "Fixed-energy random coding with rescaled codewords at the transmitter," *International Zürich Seminar on Communications* (IZS), 2016.
- [O21] Jonathan Scarlett, Vincent Tan, and Giuseppe Durisi, "The dispersion of nearest-neighbor decoding for additive non-Gaussian channels," *International Zürich Seminar on Communications* (IZS), 2016. (Invited)
- [O20] Jonathan Scarlett and Volkan Cevher, "Limits on support recovery with probabilistic models: An information-theoretic framework," *IEEE International Symposium on Information Theory* (ISIT), 2015.
- [O19] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "The likelihood decoder: error exponents and mismatch," *IEEE International Symposium on Information Theory* (ISIT), 2015.
- [O18] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Refinements of the thirdorder term in the fixed error asymptotics of constant-composition codes," *IEEE International* Symposium on Information Theory (ISIT), 2015.
- [O17] Jonathan Scarlett and Vincent Tan, "Second-order asymptotics for the discrete memoryless MAC with degraded message sets," *IEEE International Symposium on Information Theory* (ISIT), 2015.
- [O16] Ilija Bogunovic, Volkan Cevher, Jarvis Haupt, and Jonathan Scarlett, "Active learning of selfconcordant like multi-index functions," *IEEE International Conference on Acoustics, Speech* and Signal Processing (ICASSP), 2015.

- [O15] Alfonso Martinez, Jonathan Scarlett, Marco Dalai, and Albert Guillén i Fàbregas, "A complexintegration approach to the saddlepoint approximation for random-coding bounds," *International Symposium on Wireless Communications Systems* (ISWCS), 2014. (Invited)
- [O14] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Mismatched multi-letter successive decoding for the multiple-access channel," *IEEE International Symposium on Information Theory* (ISIT), 2014.
- [O13] Jonathan Scarlett, "On the dispersion of dirty paper coding," *IEEE International Symposium* on Information Theory (ISIT), 2014.
- [O12] Jonathan Scarlett and Vincent Tan, "Second-order asymptotics for the Gaussian MAC with degraded message sets," *IEEE International Symposium on Information Theory* (ISIT), 2014. (Shortlisted for the student paper award)
- [O11] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "The saddlepoint approximation: Unified random coding asymptotics for fixed and varying rates," *IEEE International* Symposium on Information Theory (ISIT), 2014.
- [O10] Jonathan Scarlett, "Second-order rate of constant-composition codes for the Gel'fand-Pinsker channel," International Zürich Seminar on Communications (IZS), 2014.
- [O9] Jonathan Scarlett, Li Peng, Neri Merhav, Alfonso Martinez, and Albert Guillén i Fàbregas, "Expurgated random-coding ensembles: Exponents, refinements and connections," *Interna*tional Zürich Seminar on Communications (IZS), 2014.
- [O8] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "A derivation of the asymptotic random-coding prefactor," Allerton Conference on Communication, Control, and Computing, 2013.
- [O7] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Second-order rate region of constant-composition codes for the multiple-access channel," Allerton Conference on Communication, Control, and Computing, 2013.
- [O6] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Superposition codes for mismatched decoding," IEEE International Symposium on Information Theory (ISIT), 2013.
- [O5] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "The mismatched multipleaccess channel: General alphabets," *IEEE International Symposium on Information Theory* (ISIT), 2013.
- [O4] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Cost-constrained random coding and applications," *Information Theory and Applications Workshop*, 2013. (Invited)
- [O3] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "An achievable error exponent for the mismatched multiple-access channel," Allerton Conference on Communication, Control, and Computing, 2012.
- [O2] Jonathan Scarlett, Alfonso Martinez, and Albert Guillén i Fàbregas, "Ensemble-tight error exponents for mismatched decoders," Allerton Conference on Communication, Control, and Computing, 2012.
- [O1] Jonathan Scarlett, Jamie Evans and Subhrakanti Dey, "How much training is needed in fading multiple access channels?," *International Symposium on Wireless Communication Systems* (ISWCS), 2011.