Christopher Tosh

CONTACT INFORMATION

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EDUCATION

Doctor of Philosophy, Computer Science 2012–2018
University of California, San Diego
Advisor: Sanjoy Dasgupta
Dissertation: Algorithms for statistical and interactive learning tasks

Bachelor of Science, Computer Science and Mathematics 2008–2012
University of Texas at Austin

ACADEMIC APPOINTMENTS

Associate Research Scientist 2021–Present
Memorial Sloan Kettering Cancer Center
Supervisor: Wesley Tansey

Postdoctoral Research Scientist 2018–2021
Columbia University
Supervisor: Daniel Hsu

AWARDS

NSF Graduate Research Fellow

Williams Scholar, University of Texas at Austin, Department of Mathematics

University Honors 2008–2012, University of Texas at Austin

Member, Phi Beta Kappa

PUBLICATIONS AND PREPRINTS

M. Dewaskar, **C. Tosh**, J. Knoblauch, and D. B. Dunson. Robustifying likelihoods by optimistically re-weighting data. *arXiv preprint arXiv:2303.10525*, 2023.

C. Tosh, M. Tec, and W. Tansey. Targeted active learning for probabilistic models. *arXiv preprint arXiv:2210.12122*, 2022.

C. Tosh and D.Hsu. Simple and near-optimal algorithms for hidden stratification and multi-group learning. Thirty-Ninth International Conference on Machine Learning (ICML), 2022.

W. Tansey, **C. Tosh**, D. Blei. A Bayesian model of dose-response for cancer drug studies. Annals of Applied Statistics, 2022.

C. Tosh, M. Tec, and W. Tansey. Targeted active learning for probabilistic models. *arXiv preprint arXiv:2210.12122*, 2022.

C. Tosh, Akshay Krishnamurthy, and D. Hsu. Contrastive learning, multi-view redundancy, and linear models. Thirty-Second Conference on Algorithmic Learning Theory (ALT), 2021.

M. Simchowitz, **C. Tosh**, A. Krishnamurthy, D. Hsu, T. Lykouris, M. Dudík, and R. E. Schapire. Bayesian decision-making under misspecified priors with applications to meta-learning. Neural Information Processing Systems (NeurIPS), 2021.

C. Tosh, Akshay Krishnamurthy, and D. Hsu. Contrastive estimation reveals topic posterior information to linear models. Journal of Machine Learning Research (JMLR), 2021.

C. Tosh, P. Greengard, B. Goodrich, A. Gelman, A. Vehtari, and D. Hsu. The piranha problem: Large effects swimming in a small pond. *arXiv preprint arXiv:2105.13445*, 2021.

S. Dasgupta, **C. Tosh**. Expressivity of expand-and-sparsify representations. *arXiv preprint arXiv:2006.03741*, 2020.

C. Tosh, D. Hsu. Diameter-based interactive structure discovery. Twenty-Third International Conference on Artificial Intelligence and Statistics (AISTATS), 2020.

S. Dasgupta, S. Poulis, and **C. Tosh**. Interactive topic modeling with anchor words. *arXiv preprint arXiv:1907.04919*, 2019.

C. Tosh, S. Dasgupta. The relative complexity of maximum likelihood estimation, MAP estimation, and sampling. Thirty-Second Conference on Learning Theory (COLT), 2019.

C. Tosh, S. Dasgupta. Interactive structure learning with structural query-by-committee. Neural Information Processing Systems (NeurIPS), 2018.

C. Tosh, S. Dasgupta. Maximum likelihood estimation for mixtures of spherical Gaussians is NP-hard. Journal of Machine Learning Research (JMLR), 2018.

C. Tosh, S. Dasgupta. Diameter-based active learning. Thirty-Fourth International Conference on Machine Learning (ICML), 2017.

C. Tosh. Mixing rates for the alternating Gibbs Sampler over Restricted Boltzmann Machines and friends. Thirty-Third International Conference on Machine Learning (ICML), 2016.

C. Tosh, S. Dasgupta. Lower bounds for the Gibbs sampler over mixtures of Gaussians. Thirty-First International Conference on Machine Learning (ICML), 2014.

PROFESSIONAL SERVICE

Co-organizer

Columbia TRIPODS 2018 Data Science Bootcamp
Columbia TRIPODS 2019 Deep Learning Workshop

Reviewer/Program committee

Journal of Machine Learning Research (JMLR)
Association for the Advancement of Artificial Intelligence (AAAI)
International Conference on Artificial Intelligence and Statistics (AISTATS)
International Conference on Algorithmic Learning Theory (ALT)
Conference on Learning Theory (COLT)
IEEE Symposium on Foundations of Computer Science (FOCS)
International Conference on Machine Learning (ICML)
Neural Information Processing Systems (NIPS/NeurIPS)
Conference on Uncertainty in Artificial Intelligence (UAI)

TEACHING EXPERIENCE

Lecturer at Columbia University Summer 2019

COMS 3203: Discrete Mathematics

Teaching assistant at UC San Diego 2016–2018

CSE 20: Discrete Mathematics
CSE 151: Machine Learning (Undergraduate)
CSE 250B: Machine Learning (Graduate)

Consulting Experience

Machine learning consultant 2018
NTENT

Machine learning consultant 2016–2018
QubitCrunch LLC