Andrew D. McRae

Georgia Institute of Technology   admcrae@gatech.edu
School of Electrical and Computer Engineering   admcrae.github.io

Research Interests	Exploiting structure in high-dimensional statistics and machine learning
	Convex relaxations and optimization for high-dimensional inference
	Regression and classification with linear/kernel methods

Education	**Ph.D. student in Electrical and Computer Engineering**	2017–Present
	Georgia Institute of Technology	
	Advisor: Mark Davenport	
	M.S. in Mathematics	2021
	Georgia Institute of Technology	
	M.S. in Electrical and Computer Engineering	2016
	Georgia Institute of Technology	
	B.S. in Applied Mathematics	2012–2015
	B.S. in Electrical Engineering	
	Georgia Institute of Technology	
	Highest Honor	

Industry Experience	**Georgia Tech Research Institute**	2016–2017
	Robotics and Autonomous Systems Division	
	Raytheon Missile Systems	Summer 2015
	Systems Test Division	

Preprints

Andrew D. McRae, Justin Romberg, and Mark A. Davenport, "Optimal convex lifted sparse phase retrieval and PCA with an atomic matrix norm regularizer," 2021, arXiv: 2111.04652 `[math.ST]`

Journal Publications

Andrew D. McRae and Mark A. Davenport, "Low-rank Matrix Completion and Denoising Under Poisson Noise," *Inform. Inference.* 10, no. 2 (2021): 697–720, arXiv: 1907.05325 `[stat.ML]`

Conference Publications

Andrew D. McRae, Austin Xu, Jihui Jin, Namrata Nadagouda, Nauman Ahad, Peimeng Guan, Santhosh Karnik, and Mark A. Davenport, "Delta Distancing: A Lifting Approach to Localizing Items From User Comparisons," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)* (May 2022)

Andrew D. McRae, Santhosh Karnik, Mark A. Davenport, and Vidya Muthukumar, "Harmless interpolation in regression and classification with structured features," in *Proc. Int. Conf. Artif. Intell. Statist. (AISTATS)* (Virtual conference, March 2022), arXiv: 2111.05198 `[stat.ML]`

Andrew D. McRae, Justin Romberg, and Mark A. Davenport, "Sample Complexity and Effective Dimension for Regression on Manifolds," in *Proc. Conf. Neural Inf. Process. Syst. (NeurIPS)* (Virtual conference, December 2020), arXiv: 2006. 07642 `[stat.ML]`

Workshop Publications

Andrew D. McRae and Mark A. Davenport, "Low-rank Matrix Completion and Denoising Under Poisson Noise," in *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)* (Toulouse, France, July 2019) **(Finalist for Best Student Paper Award)**

Presentations	"An Atomic Matrix Norm Regularizer for Sparse Phase Retrieval and PCA," in *Georgia Tech ACO Student Seminar* (Atlanta, Georgia, September 2021)
	"Risk bounds for regression and classification with structured feature maps," in *IFDS-MADLab Work. on Statistical Approaches to Understanding Modern ML Methods* (Madison, Wisconsin, August 2021)
	"Low-rank Matrix Completion and Denoising Under Poisson Noise," in *IAS Work. on Missing Data Challenges in Computation, Statistics and Applications* (Virtual conference, September 2020)
	"Sample Complexity and Effective Dimension for Regression on Manifolds," in *Bernoulli-IMS One World Symp.* (Virtual conference, August 2020)
	"Effective Dimension in Sample-complexity Bounds for Hilbert Space Regression," in *Int. Conf. High-Dimensional Probability* (Virtual conference, June 2020)
	"Low-rank Matrix Completion and Denoising Under Poisson Noise," in *Rice University DSP Seminar* (Houston, Texas, October 2019)
	"Low-rank Matrix Completion and Denoising Under Poisson Noise," in *Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)* (Toulouse, France, July 2019)

Teaching Experience	**Introduction to Artificial Intelligence** CS 3600, Georgia Tech Spring 2022
	Introduction to Signal Processing ECE 2026, Georgia Tech Fall 2020, Spring 2021
	Convex Optimization (Teaching assistant) ECE Special Topics, Georgia Tech Spring 2019
	Statistical Machine Learning (Teaching assistant) ECE 6254, Georgia Tech Spring 2018
	Advanced Digital Signal Processing (Teaching assistant) ECE 6250, Georgia Tech Fall 2017
	Introduction to Signal Processing (Teaching assistant) ECE 2026, Georgia Tech Spring 2016
	Calculus III (Teaching assistant) Math 2401, Georgia Tech Spring 2015
	Calculus II (Teaching Assistant) Math 1502, Georgia Tech Fall 2014

Honors	Georgia Tech ECE Cleaver Award (best Ph.D. proposal), 2020 Georgia Tech ARC-TRIAD fellowship, Spring 2020 Finalist for Best Student Paper Award, SPARS 2019

Georgia Tech President's Fellowship, 2017–2021
Georgia Tech ECE Cleaver Award (highest preliminary exam score), 2016
Eta Kappa Nu, 2014
Georgia Tech Faculty Honors, eight semesters, 2012–2015

Professional Activities   Reviewer for *IEEE Transactions on Information Theory*
Reviewer for *EURASIP Journal on Advances in Signal Processing*
Reviewer for *Int. Conference on Artificial Intelligence and Statistics (AISTATS)*
Officer, Eta Kappa Nu (Beta Mu Chapter), 2015–2017