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

Employment

Georgia Tech School of Electrical and Computer Engineering (GRA/GTA) School of Interactive Computing (GTA)	2017–Present
Georgia Tech Research Institute Robotics and Autonomous Systems Division	2016–2017
Raytheon Missile Systems Systems Test Division	Summer 2015

Honors

Georgia Tech ECE Cleaver Award (best Ph.D. proposal)	2020
Georgia Tech ARC-TRIAD fellowship	2020
SPARS workshop finalist for Best Student Paper Award	2019
Georgia Tech President's Fellowship	2017–2021
Georgia Tech ECE Cleaver Award (highest preliminary exam score)	2016
Georgia Tech Faculty Honors (perfect GPA), eight semesters	2012–2015

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

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)* (Singapore, 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)

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	"Delta Distancing: A Lifting Approach to Localizing Items From User Comparisons," in *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)* (Singapore, May 2022)
	"Harmless interpolation in regression and classification with structured features," in *Int. Conf. Artif. Intell. Statist. (AISTATS)* (Virtual conference, March 2022)
	"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)
	"Sample complexity and effective dimension for regression on manifolds," in *Conf. Neural Inf. Process. Syst. (NeurIPS)* (Virtual conference, December 2020)
	"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)	Spring 2022
	Introduction to Signal Processing (ECE 2026)	Fall 2020, Spring 2021
	As a teaching assistant:	
	Convex Optimization (ECE graduate special topics)	Spring 2019
	Statistical Machine Learning (ECE 6254)	Spring 2018
	Advanced Digital Signal Processing (ECE 6250)	Fall 2017
	Introduction to Signal Processing (ECE 2026)	Spring 2016
	Calculus III (Math 2401)	Spring 2015
	Calculus II (Math 1502)	Fall 2014

Service	Reviewer for *IEEE Trans. Information Theory*	
	Reviewer for *EURASIP J. Advances in Signal Processing*	
	Reviewer for *Int. Conf. Artificial Intelligence and Statistics (AISTATS)*	
	Reviewer of Ph.D. program applications for Georgia Tech ECE	2022
	Officer, Eta Kappa Nu (Beta Mu Chapter)	2015–2017