

# Andrew D. McRae

Georgia Institute of Technology  
School of Electrical and Computer Engineering

admcr@gatech.edu  
admcr@github.io

<b>Research Interests</b>	Exploiting structure in high-dimensional statistics and machine learning Convex relaxations and optimization for high-dimensional inference Regression and classification with linear/kernel methods	
<b>Education</b>	<b>Ph.D. student in Electrical and Computer Engineering</b>	2017–Present
	Georgia Institute of Technology Advisor: Mark Davenport	
	<b>M.S. in Mathematics</b>	2021
	Georgia Institute of Technology	
	<b>M.S. in Electrical and Computer Engineering</b>	2016
<b>Industry Experience</b>	Georgia Institute of Technology	
	<b>B.S. in Applied Mathematics</b>	2012–2015
	<b>B.S. in Electrical Engineering</b>	
	Georgia Institute of Technology Highest Honor	
<b>Preprints</b>	<b>Georgia Tech Research Institute</b>	2016–2017
	Robotics and Autonomous Systems Division	
<b>Journal Publications</b>	<b>Raytheon Missile Systems</b>	Summer 2015
	Systems Test Division	
<b>Conference Publications</b>	<b>Andrew D. McRae</b> , 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]	
	<b>Andrew D. McRae</b> and Mark A. Davenport, “Low-rank Matrix Completion and Denoising Under Poisson Noise,” <i>Inform. Inference.</i> 10, no. 2 (2021): 697–720, arXiv: 1907.05325 [stat.ML]	
<b>Workshop Publications</b>	<b>Andrew D. McRae</b> , 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 <i>Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)</i> (Singapore, May 2022)	
	<b>Andrew D. McRae</b> , Santhosh Karnik, Mark A. Davenport, and Vidya Muthukumar, “Harmless interpolation in regression and classification with structured features,” in <i>Proc. Int. Conf. Artif. Intell. Statist. (AISTATS)</i> (Virtual conference, March 2022), arXiv: 2111.05198 [stat.ML]	
	<b>Andrew D. McRae</b> , Justin Romberg, and Mark A. Davenport, “Sample Complexity and Effective Dimension for Regression on Manifolds,” in <i>Proc. Conf. Neural Inf. Process. Syst. (NeurIPS)</i> (Virtual conference, December 2020), arXiv: 2006.07642 [stat.ML]	
	<b>Andrew D. McRae</b> and Mark A. Davenport, “Low-rank Matrix Completion and Denoising Under Poisson Noise,” in <i>Work. on Signal Processing with Adaptive Sparse Structured Representations (SPARS)</i> (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

## **Peer Review Service**

*IEEE Transactions on Information Theory*

*EURASIP Journal on Advances in Signal Processing*

*Int. Conference on Artificial Intelligence and Statistics (AISTATS)*

<b>Other Professional Service</b>	Reviewer of Ph.D. program applications for Georgia Tech ECE Officer, Eta Kappa Nu (Beta Mu Chapter), 2015–2017
<b>Honors</b>	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