

Colin Cui

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Research Interests	Statistics, machine learning, and convex optimization. More generally, I am interested in understanding theoretical results as well as its applications.	
Education	Rutgers University MS., Statistics University of California at Davis B.S., Statistics <u>Coursework</u> Probability Theory (Ph.D. course) Statistical Inference (Ph.D. course) Decision Theory (Ph.D. course) Data Mining (Master's course) Bayesian Data Analysis (Ph.D. course) Interpretation of Data (Ph.D. course) Statistical Learning and Nonparametric Estimation (Ph.D. course, Princeton University).	
Software	R, Python, Matlab, Stata	
Papers	Colin Cui. <i>On Statistical Learning Theory, Oracle inequality, and the Lasso</i> . Dec. 2020 Avram Goldberg, et al. <i>Clinical Outcomes of Scleroderma Patients At High Risk for Pulmonary Hypertension. Analysis of the Pulmonary Hypertension Assessment and Recognition of Outcomes in Scleroderma Registry</i> . ACR/ARHP Annual Meeting, 2012. (acknowledged)	
Projects	Sparsity Recovery: Basis Pursuit/Lasso Features dimensionality reduction by solving the quadratic minimization problem to recover sparsity. Since solving ℓ_0 -norm is NP-hard, we gave ℓ_1 -norm convex relaxation as surrogate for sparsity recovery. Classification: Random Forest Imported data, performed exploratory data analysis, and plotted heatmap using <i>seaborn</i> package. Built random forest using <i>scikit-learn</i> , and evaluate model accuracy performance. Image Processing: Eigenvalue Decomposition Solving singular value problems with top k singular values and singular vectors to minimize Frobenius norm objective for image compression.	
Experience	Data Scientist Ideal (co-founder) <ul style="list-style-type: none">Some highlight	Feb. 2018 - Present Princeton, New Jersey

- Served over 100 individuals and small firms in the tri-state area with a 2-year profit
- Our client partners come from all walks of life
- Our past client partners include Columbia professor on algorithmic trading in Manhattan

Research Scholar

July 2014 – Jan 2018

Rutgers University, Department of Engineering

Piscataway, New Jersey

Advisor: Prof. Assimina Pelegri

Area of focus: Bayesian calibration to solve inverse problem in MAE using Gaussian Processes as a metamodel for parameter estimation. Quantifying parameter uncertainty with Simulation on the posterior.

Selected Project: “A Bayesian approach for characterization of soft tissue viscoelasticity in acoustic radiation force imaging” Xiaodong Zhao, Assimina Pelegri

Presentation: [SIAM Conference \(MS10\)](#) at Philadelphia, PA (March 2016)

Adjunct Faculty

Sept. 2013 – Feb. 2014

New Jersey Institute of Technology

Newark, New Jersey

- Taught Math 105 Elementary Statistics and Probability
- Duties include: teaching first year statistics course, grading, reviewing student progress

Research Assistant

Jan. 2013 – Jun. 2013

Rutgers University, Department of Statistics

Piscataway, New Jersey

Advisor: Professor Zhiqiang Tan

Area of focus: Simulated Monte Carlo methods for numerical approximation using statistical software R. Performed stochastic approximation to MCMC algorithm with empirical results in order to prepare manuscript for publication.

Selected Project: “Resampling Markov chain Monte Carlo algorithms: Basic analysis and empirical comparisons” Zhiqiang Tan

Research Intern, Dr. Gail Gong (Stanford University)

2010

- Researched in a cohort of four students on estimation in human genetics and disease
- Stimulated family data using R language and compare different ways of estimating the penetrance of disease
- co-generated cancer data, and identified bad alleles and find its probability

Conference Bayesian Inference Using Gaussian Process Metamodel in Biomedical Imaging (*with* A. Pelegri, and X. Zhao). *Conf. Mathematical Aspect of Material Science*, 2016