# Colin Cui

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**Research Interests**

Statistics, machine learning, and convex optimization. I am interested in understanding the theoretical results and its applications.

**Education**

**Rutgers University**
MS., Statistics

**University of California at Davis**
B.S., Statistics

**Coursework**
Probability Theory (Ph.D. course, Prof. William Strawderman)
Statistical Inference (Ph.D. course, Prof. William Strawderman)
Decision Theory (Ph.D. course, Prof. Harold Sackrowtiz)
Data Mining (Master's course, Prof. Javier Cabrera)
Bayesian Data Analysis (Ph.D. course, Prof. Tong Zhang),
Interpretation of Data (Ph.D. course, Prof. Minge Xie)
Statistical Learning and Nonparametric Estimation (Ph.D. course, Princeton University).

**Projects**

**Sparsity Recovery: Basis Pursuit/Lasso**
Features dimensionality reduction by solving the quadratic minimization problem to recover sparsity. Since solving $\ell_0$-norm is NP-hard, we gave $\ell_1$-norm convex relaxation as surrogate for sparsity recovery.

**Classification: Random Forest**
Imported data, performed exploratory data analysis, and plotted heatmap using *seaborn* package. Built random forest using *scikit-learn*, 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.

**Software**

**Languages:** R, Python, Julia, Matlab, Stata

**Experience**

**P1 Consulting** Princeton, New Jersey
*Statistician/Consultant*
- building analytical model for high dimensional statistics using statistical software R
- Running Python code and plotting in ggplot2 in R

**Rutgers University** *Piscataway, New Jersey*
*Research Scholar at Prof. Pelegri's group*
- Solving inverse problems using Gaussian Processes as metamodel for Bayesian calibration
- Quantifying parameter uncertainty with simulation on the posterior

- Presented at SIAM Conference regional in Philadelphia, PA

**New Jersey Institute of Technology** *Newwark, New Jersey*

Adjunct Faculty

- Duties include: teaching statistics course, review student progress, performance, registration

**Rutgers University, Department of Statistics** *Piscataway, New Jersey*

*RA for Professor Zhiqiang Tan*

- Simulated Monte Carlo methods for numerical approximation using statistical software R
- Performed stochastic approximation to advanced MCMC algorithm
- Worked on preparing manuscript for publication

**Robert Wood Johnson Medical School** *New Brunswick, NJ*

*Graduate Assistant* (Supervisor: Dr. Qingyu Meng)

- Running Lasso regression and penalized regression for high-dimensional data
- implementing feature selection, shrinkage, and sparsity recovery
- code, build, and debug in R software

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

**Papers** GoldBerg, et al. Clinical Outcomes of Scleroderma Patients At High Risk for Pulmonary Hypertension. Analysis of the Pulmonary Hypertension Assessment and Recognition of Outcomes in Scleroderma Registry. *ACR/ARHP Annual Meeting*, 2012. (**acknowledged**)