**Guanglei Cao**

**Email:** caogl@umich.edu **Tele:** 7039498670

McIntyre 1730, Ann Arbor, MI 48109

**OBJECTIVE:**

Hoping to land an internship position as a software engineer or data analyst

**PROJECT AND CODE PORTFOLIO:**

https://github.com/caogl

**EDUCATION:**

**University of Michigan, Ann Arbor** 07.2013-present

* Master in Financial Engineering, Information System
* Related Courses: Data Structure and Algorithm Analysis, Operating System, Machine learning, Database Management System, Financial Engineering, Scientific Computing

**Georgetown University, Washington DC** 09.2012-01.2013

* Related Courses: Generalized Linear Models, Data Analysis, Econometrics GPA 3.6/4.0

**Dalian University of Technology, Liaoning, China** 09.2008-07.2012

* Bachelor in Applied Mathematics GPA 3.6/4.0
* Related Courses: Mathematical Analysis, Linear Algebra, Probability, Statistics, Real Analysis, Complex Analysis, Partial Differential Equations, Optimization Methods, Topology, Computer Programming, Computer Organization

**RESEARCH EXPERIENCE:**

**Research Assistant in Department of Mathematics and Statistics, Washington DC** 12.2012-03.2013

* Advisor: Kimberly.F.Sellers, Assistant Professor, Georgetown University
* Developed a method to conduct the Conway-Maxwell-Skellam Regression; used the vector-generalized linear regression method to model the differences between two groups of counting data with a dispersion parameter
* Estimated the parameters in the regression model using the Fisher-Scoring method; applied the simulation method to find the approximate expectation information matrix; calculated the weight matrix in iteration procedure of the likelihood value computation; wrote the new member function in the R package “VGAM”

**COURSE PROJECTS:**

**“Thread library design and Multi-threaded programming” in Operating System, Ann Arbor, MI** 01.2014-02.2014

* Designed the thread library and monitor implementation to manage the concurrent programs on uniprocessor and multiprocessor systems; Linux kernel commands and spinlocks are used
* Applied the designed thread library and monitors on multi-threaded programming on concurrent disk service scheduling and other test cases

**“Sparse and Robust K-Means Clustering” in Machine Learning, Ann Arbor, MI** 11.2013-12.2013

* Kernel K-means and Inverse Weighed K-Means method as a robust method for substituting traditional K-Means
* Studied and implemented the Trimmed K-means method under the Lasso and Ridge constraint to deal noisy features and sparse data; used the gradient descent method with a shift in the constraint boundary to get numeric solution
* Applied these robust K-Means algorithm to pattern recognition of handwritten digits

**“Market Maker” in Data Structure and Algorithm Analysis, Ann Arbor, MI** 10.2013-11.2013

* Used various core data structures, such as heaps, hash tables and balanced binary search trees to design program to help facilitate the trading of equities on an electronic exchange market
* Optimized the run time of the program by maintaining a max-heap and min-heap to calculate the median of the order price in constant time to avoid the traversing of data structure in each market timestamp

**“Database Design and Query in Social Network Data” in Database Management, Ann Arbor, MI** 09.2013-10.2013

Designed a relational database for storing information about Facebook social media network

Created tables of database according to the ER diagrams designed; populated the database with real data

Written multiple efficient queries and embedded them into Java using JDBC

**SKILLS :**

Proficient in C, C++, R, MATLAB, familiar with SQL, basic knowledge of Java

Unix operating system (multi-threaded programming)