

# CHUNLEI ZHANG

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## EDUCATION

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**Clemson University, South Carolina, USA**

Aug 2015 - Aug 2019

**Ph.D.** Candidate in Electrical Engineering and Minor in Mathematics

GPA: **4.0/4.0**

Relevant Courses: Data Analysis, Regression and Least Squares Analysis, Statistic Method, Linear Programming, Nonlinear Programming, Discrete Optimization, Stochastic Process, Telecommunication Network Modeling and Analysis

**Beihang University, Beijing, China**

Sep 2011 - Jul 2015

Bachelor of Engineering in Electronic and Information Engineering

GPA: **3.9/4.0; Top: 5%**

## DATA SCIENCE PROJECTS

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**Regression Analysis of Blood Enzyme Levels and a Health Indicator**

Sept 2018 - Nov 2018

*Course Project in R*

*Clemson University*

- Applied Variance Inflation Factor (VIF) to check the potential multicollinearity within 100 kinds of blood enzyme
- Fitted models based on correlation, Stepwise Regression, Ridge Regression and LASSO with proper penalty parameters
- Conducted hypothesis test to determine the model suitability based on p-value and obtained the PRESS value of each model
- Selected the most appropriate model based on Akaike Information Criterion (AIC) and cross validation results and wrote a report

**Regression Analysis of Local Meteorology and Air Pollution**

Aug 2018 - Oct 2018

*Course Project in R*

*Clemson University*

- Fitted linear models using forward stepwise, backward stepwise, bidirectional stepwise, and Lasso regression
- Visualized the standardized residual plot, QQ-plot, and ACF plot of each model to check the linear regression assumptions
- Conducted Box-Cox Transformation to transform non-normal dependent variable into a normal shape
- Determined the most appropriate predictive model by comparing the AIC and PRESS value.

## RESEARCH EXPERIENCE

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**Research on Decentralized Optimization Algorithms**

Jan 2017 - Present

*Research Assistant; Advisor: Dr. Yongqiang Wang*

*Clemson University*

- Designed two novel algorithms which enabled data privacy-preservation in decentralized optimization based on Alternating Direction Method of Multipliers (ADMM) and Subgradient Method
- Analyzed the convergence rate of the ADMM-based algorithm, which is  $O(1/k)$
- Implemented the ADMM-based algorithm on twelve Raspberry Pi boards in C++
- Evaluated the proposed algorithms on average consensus problem, linear regression problem, etc in C++

**Research on Application of Decentralized Optimization**

Sep 2015 - Dec 2016

*Research Assistant; Advisor: Dr. Yongqiang Wang*

*Clemson University*

- Proposed two distributed localization algorithms based on ADMM and proved the convergence rates of the proposed algorithms are  $O(1/k)$
- Compared the proposed algorithms with some existing localization algorithms via Matlab simulations, which suggested a 15% performance improvement in localization accuracy

## SKILLS

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- Fluent: Python (numpy, pandas, matplotlib, sklearn), Matlab, R, Git, Latex
- In Training: Java, SQL, SAS, Hadoop, MapReduce

## PUBLICATIONS

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- [7] **C. L. Zhang**, Y. Q. Wang, Privacy-preserving Decentralized Optimization based on ADMM. *IEEE Transactions on Information Forensics and Security* 14.3 (2019): 565-580.
- [6] **C. L. Zhang**, Y. Q. Wang, Distributed event localization via alternating direction method of multipliers. *IEEE Transactions on Mobile Computing* 17.2 (2018): 348-361.
- [5] **C. L. Zhang**, Y. Q. Wang, Enabling Privacy-preservation in Decentralized Optimization. Accepted to *IEEE Transactions on Control of Network Systems*
- [4] **C. L. Zhang**, Y. Q. Wang, Sensor Network Event Localization via Non-convex Non-smooth ADMM and Augmented Lagrangian Methods. Accepted to *IEEE Transactions on Control of Network Systems*.
- [3] H. Gao, **C. L. Zhang**, M. Ahmad, Y. Q. Wang. Privacy-Preserving Average Consensus on Directed Graphs Using Push-Sum. *IEEE Conference on Communications and Network Security*, 2018.
- [2] T. Shang, **C. L. Zhang**, K. Li, J. W. Liu, Nonlinear quantum network coding with classical communication resource. *IEEE Globecom Workshops*, 2015.
- [1] **C. L. Zhang**, H. Gao, Y. Q. Wang. Enabling Privacy-preservation in ADMM based Decentralized Optimization using Function Decomposition. Submitted to *IEEE Transactions on Signal Processing*.

## AWARDS

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Chinese Government Award for Outstanding Self Finance Students Abroad	2018
Harris Award for the Outstanding Graduate Researcher	2018
Scholarship of Excellent Academic Performance of Beihang University	2011-2014
National Endeavor Fellowship of China (10%)	2012-2013
Academic Excellence Student of Beihang University (5%)	2012-2013