

## CONG (MARK) MU

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### EDUCATION

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<b>Johns Hopkins University</b> (Baltimore, MD)	08/2017 –
<b>Doctor of Philosophy   Major: Applied Mathematics and Statistics</b>	
<b>Master of Science in Engineering   Major: Applied Mathematics and Statistics</b>	
<b>Sun Yat-Sen University</b> (Guangzhou, China)	08/2013 – 06/2017
<b>Bachelor of Science   Major: Statistics   Minor: Finance</b>	

### RESEARCH EXPERIENCE

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#### Statistical Models for Large Networks | Johns Hopkins University

- Built network models that could be scaled to analyze large networks; estimated and simulated network formation models using high performance computing; developed R package with research objectives such as identifying the community structure
- Key words: **Hierarchical Exponential-Family Random Graph Models, (Generalized) Random Dot Product Graph, SBM with Covariates, Variational generalized EM algorithms, Minorize-Maximization, Parallel Computation**
- Dynamic Network Structure [[Shiny App](#)]
- (G)RDPG with Covariates [[R Package](#)](Private now)

#### Automatic Tools for Dash Cam Video | Johns Hopkins University

- Developed automatic tools for analyzing and annotating video stream with relevant information such as timing, speed, traffic, accidents, objects and etc
- Key words: **Structural Similarity Index, Oriented FAST and Rotated BRIEF, Image Hashing, Robust Image Similarity Measure, Deep Neural Networks**
- Mu, C., & Budavári, T. (2018). Dash Cam Video Analysis: Laptimes and Beyond. Poster presented at [2018 IDIES Annual Symposium](#), Baltimore, MD. [[Poster](#)]

#### Constructing Affinity Matrix for Spectral Clustering | Johns Hopkins University

- Built a framework on constructing affinity matrix for spectral clustering; developed corresponding theoretical justification on different setting
- Key words: **Low-Rank Subspace Clustering, Sparse Subspace Clustering, Spectral Curvature Clustering, Profile Likelihood, Model-based Clustering, Random Dot Product Graph**
- On Constructing Affinity Matrix [[Draft](#)]

#### Therapy Functional Measures | Johns Hopkins University & Johns Hopkins Hospital

- Identified patterns in patient functional trajectories; measured causal effect of different physical therapy dosage regimes on patient functional status; constructed features and built model to predict AMPAC score to optimize physical therapy in the hospital
- Key words: **Linear Mixed-Effect Model, ARIMA, Causal Inference**
- Crockett M., Mu, C., & Dahbura, A. T. (2018). Predictive Analytics for Patient Mobility Using AM-PAC. Poster presented at [2018 Johns Hopkins Research Symposium on Engineering in Healthcare](#), Baltimore, MD. [[Poster](#)]

## Text Mining and Information Extraction | Johns Hopkins University

- Collaborated with different teams to mine the large-scale text data, speculated gender based on names; extracted information from large-scale data sets; crawled online data
- Key words: **Natural Language Processing, Regular Expression, Crawler**

## PROFESSIONAL EXPERIENCE

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**Analyst Intern | GF Fund Management** (Guangzhou, China) 11/2016 – 04/2017

- Selected features to build market emotional indicators and developed model to predict market, achieved 92% accuracy (**XGBoost, Random Forest, Logistic Regression, Lasso**)
- Mined key business data and constructed data reporting system; analyzed and visualized product and user data to provide decision support (**R Markdown, R Shiny**)

**Data Science Intern | Research Center of Statistical Science** (Guangzhou, China) 02/2016 – 10/2016

- Classified users to optimize delivery of advertisements and constructed program recommendation system; predicted whether user will be secondary loans to explore potential customers and evaluate risk in advance (**Collaborative Filtering, Clustering**)
- Presented in 9th China-R Conference and Regional Data Science Conference on how to use R to interact and share ideas by using Shiny in R to make an interactive interface rapidly (**R Shiny**)

## TEACHING EXPERIENCE

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**Teaching Assistant | Johns Hopkins University**

- Data Mining ([Spring 2018](#), [Spring 2019](#), [Fall 2019](#))
- Applied Statistics and Data Analysis ([Fall 2019](#))

## RELEVANT COURSES

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**Johns Hopkins University** 08/2017 –

- Matrix Analysis, Probability Theory, Statistical Theory, Nonlinear Optimization
- High-Dimensional Approximation, Probability and Statistical Learning
- Statistical Pattern Recognition Theory & Methods, Statistical Machine Learning
- Applied Statistics and Data Analysis, Data Mining, Mathematical Image Analysis

**Sun Yat-Sen University** 08/2013 – 06/2017

- Mathematical Analysis, Linear Algebra, Real Analysis, Functional Analysis
- Probability Theory and Statistics, Mathematical Statistics
- Applied Regression Analysis, Time Series Analysis, Nonparametric Statistics
- Modern Multivariate Statistics: Data Mining, Complex Data Analysis (Case Study)
- Mathematical Experiments & Mathematical Software, Data Structure and Algorithms

## SKILLS

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R (statnet, mclust, dplyr, ggplot2, shiny, Rmpi), Python (NumPy, Pandas, scikit-learn)  
Matlab, C/C++, SQL, TensorFlow, OpenCV, Data Visualization, Machine Learning