Chang Che | Resume

Ph.D. in Quantitative Psychology, M.S. and B.S in Statistics – Chicago, IL

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Professional Summary

Massive Data Analytical and Empirical Research Experience: Over 8 years experiences in both empirical experiment design and big data analysis. Adapt the newest statistical models and big data analysis into social science research to achieve valid explanations and accurate predictions of human behaviors.

Methodology Developer: Develop and scale innovative statistical methods aimed at efficiently analyzing data and digging out extra information that traditional approaches fail to.

Strong Programming Skills: Nine years of experience in quantitative analysis using R/Python to provide the perfect statistical solutions to various projects. Developed statistical packages for computing network homophily statistics.

Strong Communication Skills as a Team-player: Lead several critical projects in industry and academia. Collaborate with researchers from different disciplines. Enjoy connecting people for the same research purpose. Won an award for instructing an undergraduate introduction-level statistics courses.

Technical and Personal Skills

- Expert in statistical tools: R, SQL, Python.
- Proficient in: SAS, SPSS, Matlab, Stata, Mplus.
- Basic ability with: C, C++.

Work Experience

Meta Platforms Inc. **Remote in Greater Chicago, IL**
Senior Data Scientist *2021 August – Now*

- Data scientist lead in Augmented Reality teams in Meta's Reality Labs. Build the performance and reliability measurement framework to interpret, monitor, and optimize AR platform health. Bridge user experience and Meta services and platform performance to inform and guide team strategies. Collaborate with Bay Area, New York, and London AR teams to create a healthy AR ecosystem.

Facebook Inc. **Menlo Park, CA**
Data Scientist Analytics Intern *2020 Summer*

- Lead a data mining project to promote incremental recommendation success for Facebook's People You May Know feature to connect friends on social network. Modeled Facebook app's recommendation system internal cannibalism and improved the promotion efficiency.

Education

Academic Qualifications

University of Notre Dame **Notre Dame, USA**
Ph.D. in Quantitative Psychology *2016–2021*
GPA: 3.99

University of Notre Dame **Notre Dame, USA**
M.S. in Applied and Computational Mathematics and Statistics *2017–2019*
GPA: 4.0

Sun Yat-Sen University **Guangzhou, China**
B.S. in Statistics and Psychology, Two honors theses *2016*
GPA: 3.8

Yonsei University **Seoul, Korea**
International Exchange Program in Applied Statistics *2012*

Fellowships

ND PIER/Burns Fellowship — **Notre Dame, USA**
Notre Dame Program for Interdisciplinary Education Research (ND PIER) — *2016–present*
http://pier.nd.edu/people/nd-pier-and-burns-fellows/
- Lead an education-related project using network analysis and data science techniques.

Honors and Awards

Award for Excellence as a Graduate Student TA or Instructor — **Notre Dame, USA**
For TAing the Fall 2017 Experimental Psychology I: Statistics Course — *2018*

Publications and Projects

Publications

- **Che, C.**, Jin, I., & Zhang, Z. Network Mediation Analysis Using Model-based Eigenvalue Decomposition, *Structural Equation Modeling: A Multidisciplinary Journal (2020): 1-14*

Abstract: This paper proposes a new two-stage network mediation method based on the use of a latent network approach – model-based eigenvalue decomposition – for analyzing social network data with nodal covariates. In the decomposition stage of the observed network, no assumption on the metric of the latent space structure is required. In the mediation stage, the most important eigenvectors of a network are used as mediators. This method further offers an innovative way for controlling for the conditional covariates, and it only considers the information left in the network. We demonstrate this approach in a detailed tutorial R code provided for four separate cases – unconditional and conditional model-based eigenvalue decompositions for either a continuous outcome or a binary outcome – to show its applicability to empirical network data.

PhD Dissertation

- **Che, Chang.** A Longitudinal Social Network Mediation Method

Abstract: There has been elevating research interest in social network analysis along with prosperous methodology and application studies in network science and other social sciences. Most of the studies made a great effort to explain how human behavior, as the nodal effect, and the network structure, as an environmental system, impact each other. Although the causal inference implied in these researches is naturally dynamic, most social network methods are cross-sectional. Yet, we haven't seen any attempts to incorporate longitudinal mediation analysis with social network analysis. In this dissertation, I propose a new approach to integrating the longitudinal mediation method and social network data. It can provide a better interpretation of the intervened influence between behavior and network. In this proposed method, dynamic networks are modeled as mediators and behavioral variables as either the dependent or the independent variable.

Notable Academic Projects

- **Intensive Longitudinal Social Network Analysis** *'Mixed effect social network analysis on the impact of the similarity of features toward dyadic text messages'*
  Lead this research taking advantage of intensive longitudinal method to understand dynamic social networks among undergraduate college students. Build mixed effect models and optimize the estimation approach to deploy the complex statistical modeling. Aim to provide a plausible interpretation model and an accurate prediction of social network change.
- **Masters Project – Social Network Mediation Methodology:** *'Eigenmodel Latent Space Analysis'*
  Lead this research developing a new method analyzing social network data by introducing an underused eigenvalue-eigenvector approximation technique for mediation analysis. This project has been submitted to a peer-review journal.
- **Bayesian Social Network Analysis Project:** *'Social Network Analysis with a Latent Space Factor Model'*
  Utilize Bayesian estimation techniques to estimate the proposed model parameters in this simulation study and conduct empirical data analyses as examples. This project is ready for submission.
- **Text Mining Project:***'Unsupervised and Supervised Text Mining Simulation on Teaching Evaluation Report'*
  Simulated latent Dirichlet allocation topic modeling data related to the topics of teaching evaluation. Investigated whether it is feasible to recover the relationship between qualitative texts and other quantitative variables such as teaching rating.
- **Joint Latent Space Modeling Dental Advisory Network with Item Response Theory:** *'Investigation on the Mediation Impact of Sugar-intake Habit on the Relation between Advisory Network and Dental Visit Habit'*
  Using an advisory network data and survey data to form the causal mediation inference to explain how social network influences or is influenced by sugar-intake in food and dental visit habits of patients.

Conference Presentations

- **Talk Presentation** — **Notre Dame, USA**
  Annual Convention of International Society for Data Science and Analytics — *May 2020*
  'Evaluation of the Unsupervised Latent Dirichlet Allocation Model through Simulation'
- **Symposium (Big Data in Psychology) Presentation** — **Chicago, USA**
  Annual Convention of American Psychological Association — *August 2019*
  'Network Analysis'
- **Talk Presentation** — **Santiago, Chile**
  Annual Convention of Psychometric Society — *July 2019*
  'Social Network Analysis in Education and Psychology'
- **Poster Presentation** — **San Francisco, USA**
  Annual Convention of Association of Psychological Science — *May 2018*
  'Improved Methods for Detecting Differential Item Functioning in Random Item Mixture Model'