Chuan Du (Sophie)

Curriculum Vitae

111 E Healey St, Apt 207
61820 Champaign
Illinois, U.S.
+1 (217) 417 8936
chuandu2@illinois.edu
chuandu2.github.io

EDUCATION

Sep 2018 – Dec 2019 **Northwestern University McCormick School of Engineering**, Evanston, IL.
Master of Science in Analytics

2014 – May 2018 **University of Illinois at Urbana Champaign**, Urbana-Champaign,IL.
Bachelor of Science in Applied Mathematics *GPA:3.85/4.0*
Bachelor of Science in Statistics
Minor: *Informatics / Computational Science & Engineering*
Honors: Meritorious Winner of Interdisciplinary Contest in Modeling 2017
Dean's List for 4 times
Pi Mu Epsilon Mathematics Honor Society
Association for Women in Mathematics

May – June 2017 **Vienna University of Economics and Business**, Vienna, Austria.
Austria – Illinois Exchange Program *GPA:4.0/4.0*

Publications & Preprints

Preprint **RGB image-based data analysis via discrete Morse theory and persistent homology**, *with C. Szul, A. Manawa, N. Rasekh, R. Guzman, R. Davidson*, arXiv:1801.09530.

RELATED COURSE WORK

Mathematics

- Abstract Linear Algebra
- Abstract Algebra
- Applied Complex Variables
- Differential Equations
- Linear Programming
- Numerical Method
- Real Analysis

Statistics and Data Science

- Advanced Data Analysis
- Advanced Data Science:Clustering, Probabilistic Programming, Data Mining, Text Mining, Graph Analysis, Cloud Computing
- Machine Learning
- Regression Analysis
- Statistical Data Management
- Statistical Learning

EXPERIENCES

RESEARCH AND PROJECTS

Jan 2016 – present **Undergraduate Researcher**, *Discrete Morse Theory, Vector Fields and Material Science*, Illinois Geometry Lab, Urbana-Champaign, IL.

- Co-worked with the team to fork ANU (Australia National University) programs from GitHub, install, compile, and run algorithms correctly
- Learned the math background, instructed the programmers to grasp the usage of ANU's code, and constructed a custom model of vector field of DMF in cubical complex
- Applied Discrete Morse Theory to compress massive data sets into critical shapes and extracted data from open-source heat maps of water resources and crime rates data
- Designed a converter using Python to convert RGB values into grayscale, generated data-informative persistence diagrams, and analyzed homology of persistent pairs with the diagrams

Aug 2017 **Intern Researcher**, *Biological Big Data: Random Walk in MicroRNA-Disease Associations*, Chinese Academy of Sciences, Beijing, China.

- Aimed at developing a new algorithm to establish the association between miRNA and diseases
- Mastered random walk algorithm, KATZ measurement method as well as efficiency validation methods of LOOCV and K-fold cross validation
- Developed the algorithm for miRNA-disease associations after constructing the mathematical models based on the corresponding integrated similarity of diseases and miRNA including Gaussian interaction profile kernel similarity, semantic similarity and functional similarity

Jan 2017 **Team Leader**, *Waiting in Airport Security Checkpoint: A Perspective from Queueing Theory*, 2017 MCM/ICM, Urbana-Champaign, IL.

- Led a group to build up a mathematical model for increasing checkpoint throughput and reducing variance in wait time
- Conducted empirical analysis using R, established the model with multiple functions, proposed and implemented a feasible method in estimating passenger volume at various times
- Developed two modifications to current procedural model, with the first one incorporating a Bifurcation System and the second designing a Circular Line-up System

INVITED TALKS

2016 **"Discrete Morse Theory, Vector Fields and Material Science"**.
(1) UIUC Illinois Geometry Laboratory Open House, May & December (2) University of Illinois at Chicago Undergraduate Mathematics Symposium 2016, October

2016 **"Conducting Research as an Undergraduate"**.
UIUC Undergraduate Research Information Session & Panel, November, Urbana-Champaign, IL

VOCATIONAL

June – July 2017 **Investment Analyst Intern**, *Function Capital - Silicon Valley Office*, Redwood City, CA.

- Consolidated and analyzed the financial data of target companies with Excel to generate reports for investment decision-making
- Investigated initial financing of target project, conducted competitive landscape of each competitor to analyze technical barriers and competitiveness
- Completed trends reports for 4 projects in fields of machine learning, deep learning, AI-AGV and robotics
- Attended two industry-related events of Sensors Expo & Conference and SYNC 2017 to grasp industry prospects

July – August 2016 **Manager Assistant**, *Banking Department, Huaxia Bank*, Shenyang, China.

- Calculated and checked corporation clients' accountings with balance sheet, income statements and cash flow statements, and input data into the banking system
- Performed pre-loan investigation and loan review
- Categorized and updated customer credit information in the system
- Developed and promoted a working methodology to shorten the time of searching and collecting customer account number from 2.5 hours to 0.5 hours

Jan 2016 – Present **Teaching and Course Assistant**, *Department of Statistics and Economics*, Champaign, IL.

- Graded tests and homework for applied statistics methods and macroeconomics principles
- Managed online discussion board, held office hours and review sessions, and proctored exams

ACTIVITIES

Aug 2015 – Present **Cultural Diversity Intern**, *Armory House Properties LLC*, Urbana-Champaign, IL.

- Founded *Language Table Program* to pair up Chinese language and culture learners with Chinese native speakers
- Designed multi-culture sharing activities and tutored Chinese calligraphy

Sep – Nov 2017 **Committee Member**, *Math Department Teaching Awards Committee*, Urbana-Champaign, IL.
This committee selects exemplary graduate students as departmental teaching awards recipients.

- Read and evaluated teaching statements and portfolios, observed and interviewed applicants, and assisted the committee in distributing the final rewards

2014 – Present **Pianist**, *Music Perception Team at Champaign First United Methodist Church*, Champaign, IL.

PROGRAMMING LANGUAGES

Python	Advanced	R	Advanced
SAS	Intermediate	LaTeX	Advanced

LANGUAGES

Chinese	Native	English	Fluent
German	Intermediate		

CERTIFICATION

- **Machine Learning** by Stanford University on Coursera. Certificate earned on Aug 21, 2017
- **SAS Certified Base Programmer for SAS 9** by SAS. Certificate earned on Jun 13, 2017
- **Senior Chinese Language Teacher** by IPCA. Certificate earned on Aug 21, 2014