Chuan Du (Sophie)

Curriculum Vitae

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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* *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*

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