RUIYANG WU

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RESEARCH INTERESTS

- High-dimensional statistics, machine learning, geometry and topology

EDUCATION BACKGROUND

University of Arizona, Tucson, AZ Aug 2016-Present

- Ph.D. Program in Mathematics
- GPA: 4.00/4.00
- Major Courses: *Real Analysis I II*, *Topology-Geometry I II*, *Algebra I II*, *Complex Analysis I*, *Global Differential Geometry I II*, *Theoretical Statistics I II, Statistical Machine Learning, Monte Carlo Methods*

Peking University, Beijing, China Sept 2012-Jun 2016

- B.S. in Mathematics
- Major Scores Average: 85.5/100
- Major Courses: *Mathematical Analysis*, *Advanced Algebra*, *Abstract Algebra*, *ODE*, *PDE*, *Real Analysis*, *Complex Analysis*, *Functional Analysis*, *Topology*, *Differential Geometry*, *Measure Theory*

University of California, Berkeley, CA Jul 2014-Aug 2014

- Summer Session, GPA: 4.00/4.00
- Courses: *Introduction to Statistics*, *Game Theory*

RESEARCH EXPERIENCES

TRIPODS Graduate Research Assistant Aug 2018-Present

Supervisor: ***Prof. Ning Hao*** | *University of Arizona, Tucson, AZ*

- Analyzed massive astronomical data by feature selection, dimension reduction and deep learning techniques.

Hi-C Data Normalization Jul 2018-Present

Supervisor: ***Prof. Ning Hao*** *&* ***Prof. Yue Niu*** | *University of Arizona, Tucson, AZ*

- Established a non-parametric framework for Hi-C data normalization.
- Developed a new matrix-balancing algorithm.

Rank constrained Quadratic Regression Aug 2018-Present

Supervisor: ***Prof. Ning Hao*** | *University of Arizona, Tucson, AZ*

- Proposed a low rank quadratic regression model that is more flexible than sparse quadratic models.
- Developed a fast algorithm to solve the low rank quadratic model.

A New Approach to QDA Jan 2017-Dec 2017

Supervisor: ***Prof. Ning Hao*** | *University of Arizona, Tucson, AZ*

- Proposed a classification and dimension reduction method based on the Quadratic Discriminant Analysis
- Derived some theoretical results of the method, including invariance under affine transformation and rank analysis
- Applied the method to real and simulated data, and compared it with LDA, QDA, RDA, etc.

High Dimension Data Analysis with Single Cell RNA Sequencing Jun 2014-Jun 2016

Supervisor: ***Prof. Minping Qian*** *&* ***Prof. Daquan Jiang*** | *Peking University, Beijing, China*

- Reported papers about classic clustering algorithms including K-means, DBSCAN, SPADE, PCA, etc.
- Applied SPADE to flow cytometry date from leukemia patients and found some details which used to be ignored by clinical doctors
- Picked out message-carrying genes of RNA-sequencing data from the same patients and applied PCA to them
- Used quantile normalization to map these two data sets, and compared the clustering results

Social Network and Epidemic Spreading Jan 2015-Feb 2015

Supervisor: ***Dr. Aming Li*** | *Peking University, Beijing, China*

- Analyzed the spread of epidemic using scale-free network model and optimized the strategy of giving medicine
- Generated a network based on real data set and performed randomized experiment to compare random immunization and selective immunization

CONFERENCE PRESENTATION

- "Quadratic Discriminant Analysis by Projection", ICSA 2018 Applied Statistics Symposium, New Brunswick, NJ, Jun 2018

AWARD

- Galileo Circle Scholarship, University of Arizona Apr 2019

SKILLS

- Computer Programming: C, R, MATLAB
- Languages: Mandarin(native), English(proficient)
- Interests: violin, chess, painting