

# Qiuyi Wu

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**Research Interests** Functional Data Analysis, Kernel Smoothing, Image Processing, High Dimensional Regression, Text Mining, Recommender System, Spatial Statistics, AI Fairness

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## Employment

**Sep.2024 - Present** - **Duke University**, Department of Biostatistics and Bioinformatics, US  
*Postdoc Research Fellow*  
Mentor: Dr. Anru Zhang

## Education

**2019-2024** Ph.D., Statistics, United States  
**University of Rochester**, Department of Biostatistics and Computational Biology  
Advisor: Dr. Xing Qiu

**2016-2018** M.S., Applied Statistics, United States  
**Rochester Institute of Technology**, School of Mathematical Sciences  
Advisor: Dr. Ernest Fokoue

**2012-2016** B.Econ., Finance, China  
**Donghua University**, Glorious Sun School of Business and Management

## Honors and Awards

### Scholarship

- **William Jackson Hall Graduate Student Fellowship** for academic excellence, 2023-2024  
*awarded annually to one PhD student in UR Biostat Dept through the combination of outstanding performance in coursework and qualifying exams; excellence in their service as a graduate student teaching assistant; and timely completion of a dissertation containing work judged to be of particular significance in both its methodological contribution and potential impact in applications.*
- **Dean's Ph.D. Fellowship** for PhD study in University of Rochester, 2019-2021
- **RIT Merit Scholarship** for Master Study in RIT, 2016-2018

### Conference Award

- **Clinton Miller Award** for Best Student Poster in SRCOS Summer Research Conference, *Clemson*, 2024
- **Gold Medal for Best Methodology and Theory Award** in UPSTAT Conference, 2024
- **Gold Medal for Data Analytics Competition** in UPSTAT Conference, 2021
- **ASA Section on Text Analysis Best Student Presentation Award** in JSM Conference, 2020
- **Gold Medal for Best Student Research Award** in UPSTAT Conference, 2019

- **NC ASA Young Researcher Award** in AISC Conference, 2018
- **Gold Medal for Best Computation and Application Award** in UPSTAT Conference, 2018
- **Promising Academic Leader Award** in UPSTAT Conference, 2018
- **Young Scientific Leader Award** in UPSTAT Conference, 2017
- **Student Scholarship Winners** for SAS Global Forum, 2017

### Travel Award

- **ASA Travel Award** for Preparing to Teach Statistics and Data Science Workshop, *Oregon*, 2024
- **Travel Award** for FutureBAProf Workshop, *Iowa*, 2024
- **NSF/Boyd Harshbarger Travel Award** for SRCOS Summer Research Conference, *Clemson*, 2024
- **SIAM Travel Award** for SIAM SEAS Conference, *VT*, 2023
- **ASA BIPOC DWMP Travel Award** for JSM Conference, *Washington DC*, 2022
- **SAMSI Travel Award** for Closing Ceremony, *Duke*, 2021
- **ACNN Travel Award** for Big Data Neuroscience Workshop, *UMich*, 2019
- **SAMSI Travel Award** for Deep Learning Opening Workshop, *Duke*, 2019
- **ASA Travel Award** for IMS/ASA Spring Research Conference, *VT*, 2019
- **RIT Research & Creativity Travel Award** for JSM Conference, *Vancouver*, 2018

### Publications

#### *Published or Accepted:*

- 2023** LeBlanc, P, Banks, D., Fu, L., Li, M., Tang, Z., **Wu, Q.** (2023). "Recommender Systems: A Review" *Journal of the American Statistical Association* (2023): 1-21. doi: 10.1080/01621459.2023.2279695
- 2023** Panisch, L., Murphy, H., **Wu, Q.** et al (2023). "Adverse childhood experiences predict diurnal cortisol throughout gestation." *Psychosomatic Medicine*. 85(6), 507-516.
- 2022** **Wu, Q.** et al (2022). "A conditional approach for joint estimation of wind speed and direction under future climates." *Advances in Statistical Climatology, Meteorology and Oceanography* 8.2: 205-224.
- 2022** Murphy, H., Gu, Y., **Wu, Q.**, et al (2022). "Prenatal Diurnal Cortisol: Normative Patterns and Associations with Affective Symptoms and Stress." *Psychoneuroendocrinology* (2022): 105856.
- 2021** Frigau, L., **Wu, Q.**, Banks, D. (2021). "Optimizing the JSM Program." *Journal of the American Statistical Association* (2021): 1-21. doi: 10.1080/01621459.2021.1978466
- 2018** **Wu, Q.**, Fokoue, E., & Kudithipudi, D. (2018). "An Ensemble Learning Approach to the Predictive Stability of Echo State Networks. *Journal Of Informatics And Mathematical Sciences*", 10(1 & 2), 181 - 199. doi: 10.26713/jims.v10i1-2.827
- 2018** **Wu, Q.** (2018). "Statistical Aspects of Music Mining: Naive Dictionary Representation." *Thesis*. RIT Scholar Works. Accessed from <https://scholarworks.rit.edu/theses/9932>

#### *Under Review:*

- 2022** Murphy, H., **Wu, Q.**, et al. (2022). Examining the bidirectional relationship between cortisol and gestational weight gain across pregnancy (submitted to International Journal of Obesity)

***In Preparation:***

- 2024**      **Wu, Q.**, Qiu, X. (2024). Image Processing with Optimally Designed Parabolic Partial Differential Equations
- 2024**      **Wu, Q.**, Qiu, X. (2024). Optimal Gaussian Kernel Smoothing Strategy
- 2022**      LeBlanc, P; **Wu, Q.**, et al. (2022). New Ideas in Recommender Systems

***Ad-hoc***

- 2021**      Short Interview Piece appears in July 2021 issue of Amstat News magazine  
"TAIG Contest Winners Tell of Experience"

***Archived:***

- 2019**      **Wu, Q.**, Fokoue, E. (2019). Naive Dictionary On Musical Corpora: From Knowledge Representation To Pattern Recognition. *arXiv:1811.12802*

**Research Experience**

- Jun.2022 - Aug.2022**    **Liberty Mutual Insurance Company**, GRS Advanced Analytics team, US  
*Data Scientist Intern*  
Mentor: Dr. Robert Yuen  
Project Topic: Predicting the profitability of construction projects via structured data and NLP
- Jun.2020 - Aug.2020**    **Argonne National Laboratory (ANL)**, CELS/EVS Division, US  
*Research Aide Intern*  
Mentor: Dr. Jiali Wang & Dr. Whitney Huang & Dr. Julie Bessac  
Research Fields: Uncertainty Quantification; Wind Modeling
- Jun.2019 - Aug.2019**    **Argonne National Laboratory (ANL)**, CELS/MCS Division, US  
*Research Associate*  
Mentor: Dr. Julie Bessac & Dr. Whitney Huang & Dr. Jiali Wang  
Research Fields: Spatial Statistics; Extreme Value Analysis
- May.2018 - May.2019**    **Statistical and Applied Mathematical Sciences Institute (SAMSI)**, US  
*Graduate Research Fellow*  
Mentor: Dr. David Banks  
Research Fields: Text Mining; Spatial Statistics
- Dec.2016 - Nov.2017**    **Rochester Institute of Technology**, Department of Computer Engineering, US  
*Research Assistant*  
Mentor: Dr. Dhireesha Kudithipudi & Dr. Ernest Fokoué  
Research Fields: Neural Networks; Ensemble Learning; Topic Modeling

**Teaching Experience**

- 2019-2023**    **University of Rochester:** Teaching Assistant, Guest Lecturer
- BST 426 [Spr 24] - Linear Models
  - BST 426 [Spr 23] - Linear Models
  - BST 467 [Spr 21] - Applied Statistics in the Biomedical Sciences
  - BST 467 [Spr 20] - Applied Statistics in the Biomedical Sciences
- 2017-2018**    **Rochester Institute of Technology:** Teaching Assistant
- STAT 747 [Spr 18] - Principles of Statistical Data Mining
  - MATH 251 [Spr 17] - Probability and Statistics

## Consulting Experience

- Department of Biostatistics, University of Rochester.  
Responsibilities: To assist members of URMC academic community with statistical design, data analysis, and software issues for their research.
- Environmental Influences on Child Health Outcomes (ECHO-UPSIDE project)  
Responsibilities: Statistical design, data analysis and paper writing for URMC ECHO researches using models such as ICC, PCA, CCA, LMER etc.
  - Prenatal Diurnal Cortisol paper: I carried out the statistical analysis by building the lmer model, wrote code for the team and revised the statistical section of the paper.
  - Adverse Childhood Experience paper: I developed the analytic approach in the paper, edited and revised the final draft.
  - Fetal Growth project: I wrote a function to calculate estimated fetal weight percentile based on infant demographics and help the team gain insights about fetal growth curve patterns.
  - Immune Age Difference paper: I introduced the “immune age difference,” a novel variable reflecting the relative maturity of infants’ immune systems.
  - Baby Cortisol Analysis project: I conducted statistical imputation method to resolve the missing data issue in the analysis.
  - Mom Postnatal Analysis project: I did statistical analysis to batch correct the problematic batches and outliers in the data.

## Professional Service and Volunteerism

- **Officer & Webmaster**, *ASA Section on Text Analysis*, 2023 - Present
- **Session Chair**, “Approaches in Clustering for Analysis of Emerging Data Types”, *JSM*, 2022
- **Committee Member**, *ICSA 2020 Applied Statistics Symposium Photo Contest*, 2021
- **Student Representative**, *ASA Text Analysis Interest Group*, 2020 - Present
- **Event Editor**, *International Astrostatistic Association*, 2018 - Present
- **Committee Member**, *ICSA 2020 Applied Statistics Symposium Talent Show*, 2020
- **Session Chair**, *8th Annual Conference of the Upstate New York Chapters of ASA*, 2019
- **Journal Reviewer**, *IEEE Transactions on Systems, Man and Cybernetics: Systems*, 2019
- **Session Organizer**, Chair Session “Application of Text Mining”, *UpStat Conference*, 2018
- **Judge** for Pre-College Statistical Data Analysis Competition, *UpStat Conference*, 2018
- **Judge** for Undergraduate Data Competition, *ASA DataFest*, 2018
- **Mentor** for Data Competition, *ASA DataFest*, 2017 - 2018
- **Session Organizer**, Chair Session “Environment and Health”, *UpStat Conference*, 2017
- **Technical Translator**, Deep Learning for NLP at Oxford with Deep Mind, *Big Data Digest*, 2017
- **Volunteer** for Imagine RIT: Innovation + Creativity Festival, *Imagine RIT*, 2017
- **Peer Mentor**, *CET Academic Programs*, 2015 (*Honored with Best Mentor via election*)

## Presentations

- Aug.2024** Joint Statistical Meetings 2024 - Portland, OR, US - JSM24  
**Poster**, Image Processing with Optimally Designed Parabolic Partial Differential Equation
- June.2024** 59th Southern Regional Council on Statistics Summer Research Conferenc - Clemson, SC, US - SRCOS24  
**Poster**, Image Processing with Optimally Designed Parabolic Partial Differential Equation
- Apr.2024** 12th Annual Conference of the UPSTAT New York Chapters of ASA - Rochester, NY, US - UPSTAT24  
**Contributed**, Image Processing with Optimally Designed Parabolic Partial Differential Equation

- Apr.2024** Johns Hopkins SMART WG seminar, Department of Biostatistics - Baltimore, MD, US - JobTalk  
**Invited**, Image Processing with Optimally Designed Parabolic Partial Differential Equation
- Apr.2023** 11th Annual Conference of the UPSTAT New York Chapters of ASA - Rochester, NY, US - UPSTAT23  
**Contributed**, A conditional approach for joint estimation of wind speed and direction under future climates
- Mar.2023** SIAM Southeastern Atlantic Section Conference 2023 - Blacksburg, VA, US - SIAM23  
**Contributed**, A conditional approach for joint estimation of wind speed and direction under future climates
- Aug.2022** Joint Statistical Meetings 2022 - Washington DC, US - JSM2021  
**Topic Contributed**, Text Mining and Music Mining
- May.2022** UR Biostatistics Department Annual Student Workshop - Rochester, NY - URMC  
**Seminar Talk**, Partial Differential Equation & Kernel Smoothing Modeling In Image Analysis
- Sep.2021** Classification and Data Analysis Group Conference - Florence, Italy - CLADAG  
**Invited**, Minimizing Conflicts of Interest: Optimizing the JSM Program
- Aug.2021** Joint Statistical Meetings 2021 - Seattle (Virtual), US - JSM2021  
**Topic Contributed**, Minimizing Conflicts of Interest: Optimizing the JSM Program
- Feb.2021** Data Science DC - Washington DC (Virtual), US - DSDC/TAIG  
**Invited**, Text Mining and Music Mining [**Video**]
- Dec.2020** ICSA 2020 Applied Statistics Symposium - Texas (Virtual), US - ICSA2020  
**Poster**, Bayesian and Unsupervised Machine Learning Machines for Jazz Music Analysis
- Aug.2020** SIAM Conference on Mathematics of Planet Earth - California (Virtual), US - MPE20  
**Contributed**, Statistical Wind Conditions Assessment across inland and off-shore US under Future Climate Scenarios
- Aug.2020** Joint Statistical Meetings 2020 - Philadelphia (Virtual), US - JSM2020  
**Contributed**, Naive Dictionary On Musical Corpora: From Knowledge Representation To Pattern Recognition
- Aug.2019** Argonne National Laboratory - ANL/MCS  
**Lightning Talk**, Wind Conditions Assessment in North-America Under Climate Change Scenarios
- Jul.2019** Joint Statistical Meetings 2019 - Denver, US - JSM2019  
**Poster**, Exploratory analysis of Hurricane Storm Surge
- May.2019** IMS/ASA Spring Research Conference - SRC 2019  
**Poster**, Uncertainty Quantification in Tropical Cyclone Climatology
- May.2019** Statistical Perspectives on Uncertainty Quantification (SPUQ) Workshop - SPUQ 2019  
**Poster**, Exploratory Analysis of Tropical Cyclone Climatology
- Apr.2019** 6th Bayesian, Fiducial, and Frequentist (BFF) Conferences - BFF 2019  
**Poster**, Bayesian and Unsupervised Machine Learning Machines for Jazz Music Analysis
- Apr.2019** 8th Annual Conference of the UPSTAT New York Chapters of ASA - UpStat 2019  
**Poster**, Text Mining and Music Mining
- Nov.2018** SAMSI Model Uncertainty Program Storm Surge Working Group - SAMSI  
**Seminar Talk**, Initial Exploratory Analysis of Synthetic Storm Tracks (*30 minutes talk*)
- Oct.2018** SAMSI Model Uncertainty Program Data Fusion Working Group - SAMSI  
**Seminar Talk**, Data Fusion for Music Mining (*40 minutes talk*)

- Oct.2018** International Conference on Advances in Interdisciplinary Statistics and Combinatorics - AISC  
**Contributed**, Machine Learning for Music Mining with LDA Model, *SAMSI Academic Session*
- Sep.2018** Data Science Research Group in Rochester Institute of Technology - DSRG  
**Seminar Talk**, Statistical Aspects of Music Mining (*80 minutes lecture*)
- Sep.2018** Cornell Day of Statistics 2018 - Cornell  
**Poster**, Bayesian and Unsupervised Machine Learning Machines for Jazz Music Analysis
- Jul.2018** Joint Statistical Meetings 2018 - Vancouver, Canada - JSM  
**Poster**, Bayesian and Unsupervised Machine Learning Machines for Jazz Music Analysis
- Apr.2018** 7th Annual Conference of the UPSTAT New York Chapters of ASA - UpStat 2018  
**Contributed**, Music Mining In Topic Modeling Approach For Improvisational Learning
- Feb.2018** Graduate Seminar in Rochester Institute of Technology - RIT  
**Seminar Talk**, Topic Modeling with LDA Tutorial (*80 minutes lecture*)
- Nov.2017** Graduate Showcase in Neuroscience and Signal Processing Session - RIT  
**Contributed**, Statistical Challenges of Echo State Networks
- Nov.2017** 6th Annual Conference of the UPSTAT New York Chapters of ASA - UpStat 2017  
**Contributed**, Statistical Aspects about Echo State Networks

## Professional Affiliation

- American Statistical Association (ASA)
- Institute of Mathematical Statistics (IMS)
- International Astrostatistics Association (IAA)
- International Society for Bayesian Analysis (ISBA)
- Astrostatistics and Astroinformatics Portal (ASAIP)
- International Chinese Statistical Association (ICSA)

## Skills and Interests

- **Programming:** Python, R, SAS, MATLAB, L<sup>A</sup>T<sub>E</sub>X, SQL
- **Marathon:** Finish 26.2-mile journey in limited time, 2017, 2018, 2019
- **Music:** Perform Ghanaian and Senegalese music as member of African Percussion & Dance Ensemble
- **Other:** Piano, Hot Yoga, Surfing, Snowboarding, Hiking, Climbing, Taekwondo, Sketching, Culinary Arts