Yuan Fang

Contact Information
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EDUCATION

Doctor of Philosophy, Mathematical Sciences (concentration in Statistics) — August 2020
Binghamton University, Binghamton, NY
Advisor: Dr. Sanjeena Subedi (Dang)
Dissertation Title: "Model-based clustering approaches for non-Gaussian data"

Master of Arts, Mathematics
Binghamton University, Binghamton, NY — May 2016

Bachelor of Science, Mathematical Physics
University of Waterloo, Waterloo, ON, Canada — June 2014

EMPLOYMENT

Binghamton University
School of Pharmacy and Pharmaceutical Sciences — January 2023 - present
Department of Pharmaceutical Sciences
Assistant Professor of Biostatistics

Boston University, School of Public Health — September 2020 - December 2022
Department of Biostatistics
Postdoctoral Associate, Supervisor: Dr. Kathryn Lunetta

- Investigate associations between circulating inflammatory biomarkers, cognitive, and brain aging outcomes using the Framingham Heart Study (FHS) data.
- Analyze immune cell phenotypes data and their associations with cognitive outcomes in the FHS.

PUBLICATIONS

- **Fang, Y.**, MacDonald, C., Clemens, P., Gordish-Dressman, H., Hoffman, E., and Dang, U., "Modeling early heterogeneous rates of progression in Duchenne muscular dystrophy boys". *Journal of Neuromuscular Diseases*. 2023 Feb 14. Epub ahead of print. [doi]. [PMID: 36806514].
- **Fang, Y.**, Doyle MF, Chen J, Alosco ML, Mez J, Satizabal CL, Qiu WQ, Murabito JM., Lunetta KL, "Association between protein biomarkers and cognitive aging ". *PloS one*. 2022 Sep 9;17(9):e0274350. [doi]. [PMID: 36083988].
- **Fang, Y.**, Karlis, D., Subedi, S., "Infinite Mixtures of Multivariate Normal-Inverse Gaussian Distributions for Clustering of Skewed Data". *Journal of Classification*. 2022 Aug 23:1-43. [doi].
- **Fang, Y.**, Doyle MF, Alosco ML, Mez J, Satizabal CL, Qiu WQ, Lunetta KL, Murabito JM. "Cross-Sectional Association Between Blood Cell Phenotypes, Cognitive Function, and Brain Imaging Measures in the Community-Based Framingham Heart Study". *Journal of Alzheimer's Disease*. 2022;87(3):1291-1305. [doi]. [PMID: 35431244].

SUBMITTED

- **Fang, Y.**, Doyle MF, Chen J, Alosco ML, Mez J, Satizabal CL, Qiu WQ, Murabito JM., Lunetta KL, "Circulating Immune cell phenotypes are associated with age, sex, CMV, and smoking status in the Framingham Heart Study Offspring participants". (Major revision at *Aging*).
- Chen J, Doyle MF, **Fang, Y.**, Alosco ML, Mez J, Satizabal CL, Qiu WQ, Murabito JM., Lunetta KL"Peripheral Inflammatory Biomarkers Are Associated with Cognitive Function and Dementia: Framingham Heart Study Offspring Cohort" (Under review at *Aging Cell*).

IN PREPARATION

- **Fang, Y.**, Subedi, S., "Clustering microbiome data using mixtures of logistic normal multinomial models" (Ready to submit to *Scientific Report*). [Preprint]
- **Fang, Y.**, Subedi, S., Franczak, B., "Bayesian parameter estimation for mixtures of shifted asymmetric Laplace distributions" (Ready to submit to *Computational Statistics & Data Analysis*).
- **Fang, Y.**, Chen J, Murabito JM., Lunetta KL., "Evaluation of latent-class mixed-effect models for trajectory clustering in complex data sets through simulation studies" (Ready to submit to *Behavior Research Methods*).
- Dai, W., Subedi, S., **Fang, Y.**, "Variational Gaussian approximation to finite mixtures of logistic normal multinomial regression models" (Plan to submit to *Journal of Applied Statistics*).
- **Fang, Y.**, Karlis, D., Subedi, S., "A Bayesian Approach for Clustering Skewed Data Using Mixtures of Multivariate Normal-Inverse Gaussian Distributions". [Preprint]

PRESENTATIONS

- "Modeling early heterogeneity in progression in boys with Duchenne muscular dystrophy", 2023 Muscular Dystrophy Association Clinical & Scientific Conference, online (Poster presentation, March 2023).
- "Modeling heterogeneity in cognitive trajectories in the Framingham Heart Study", Monthly Scientific Progress in FHS-BAP, Pilot Grant Recipient (2022-2023) talk, Boston University, online (March 2023).
- "Clustering disease trajectories: statistical method applications and evaluation", Data Science Seminar, Department of Mathematics and Statistics, Binghamton University, Binghamton, NY (Feb 2023). ***Invited***.
- "Evaluation of latent-class mixed-effect models for trajectory clustering in complex data sets through simulation studies", Statistics Seminar, School of Mathematics and Statistics, Carleton University, online (Nov 2022). ***Invited***.
- "Immune cell phenotypes in the Framingham Heart Study Offspring participants", The Gerontology Society of America 2022 Annual Scientific Meeting, Indianapolis, IN (Poster presentation[doi], Nov 2022).
- "Mixtures of logistic-normal multinomial regression models for microbiome data", Statistics Seminar, Department of Mathematics & Statistics, Texas Tech University, online (Oct 2022). ***Invited***.
- "Evaluation of latent-class mixed-effect models for trajectory clustering in complex data sets through simulation studies", 2022 Joint Statistical Meetings, Washington, D.C. (Aug 2022).
- "Association of inflammatory proteins with cognitive aging, brain MRI markers, and incident dementia", 2022 Alzheimer's Association International Conference, online (Poster presentation, Aug 2022).
- "Association of blood cell phenotypes of peripheral pnflammation with brain imaging measures", The Gerontology Society of America 2021 Annual Scientific Meeting, online (Poster presentation [doi], Nov 2021).
- "Patterns of cognitive trajectories in the Framingham Offspring Study - some preliminary analysis", Biostatistics Seminar Series, Boston University, Department of Biostatistics (Sep 2021).
- "Cross-sectional asociation of blood cell phenotypes of peripheral inflammation with cognitive functioning ", 2021 Alzheimer's Association International Conference, online (Poster presentation [doi], July 2021).

- "Bayesian infinite mixtures of multivariate normal-inverse Gaussian distributions for clustering of skewed data", Fields CQAM Focus Program on Data Science and Optimization, Conference on Data Science, Toronto, Canada (Nov 2019). ***Invited***.
- "Bayesian infinite mixtures of multivariate normal-inverse Gaussian distributions for clustering of skewed data", 2019 American Mathematical Society Fall Eastern Sectional Meeting, Binghamton, NY (Oct 2019). ***Invited***.
- "A Bayesian approach to parameter estimation and clustering of skewed data using mixtures of multivariate normal-inverse Gaussian distributions", Binghamton University Research Days Poster Session (Poster presentation April 2019).
- "Bayesian approach to parameter estimation and clustering for the mixtures of multivariate normal-inverse Gaussian distributions", Statistics Seminar, Binghamton University Department of Mathematical Sciences (April 2018).
- "Bayesian estimation for the multivariate normal-inverse Gaussian model", 2017 Joint Statistical Meetings, Baltimore, MD (Aug 2017).

AWARDS

Foundation to Eradicate Duchenne — January 2023 - December 2023 — 12 Cal Mon
Role: PI — $27,500
"Multi-omics analyses of lipidomics, proteomics, and mRNA profiles in Duchenne Muscular Dystrophy"

2022 Boston University FHS-BAP pilot grant — April 2022 - March 2023 — 12 Cal Mon
NIA U19-AG068753 sub-project
Role: PI — $25,000
"Modeling heterogeneity in cognitive trajectories in the Framingham Heart Study"

SOFTWARE AND PROGRAMMING SKILLS

R Package

- **LNMVGA**: Mixture of logistic-normal multinomial models for clustering microbiome data
  Github link: https://github.com/yuanfang90/LNMVGA

Programing Skills

R, SASS, Python, Shell Script, MATLAB.

TEACHING EXPERIENCE

Course Coordinator — Spring 2023
PHRM 511/PHSC 611: Biostatistics
Institute: School of Pharmacy and Pharmaceutical Sciences, Binghamton University.
Outlines: descriptive statistics, inferential statistics, hypothesis testing, non-parametric methods, simple and multivariable regression methods, and survival analyses.

RSEARCH AND PROFESSIONAL EXPERIENCE

Binghamton University / Carleton University — May 2020 - June 2022

Research Assistant / Collaboration, PI: Dr. Utkarsh Dang

- Model trajectories of motor performance in Duchenne Muscular Dystrophy using both natural history data and clinical trials data.

Binghamton University, Teaching Online Certification Program January – May 2019
Online Course Developer

- Reorganize an existing course and extend it to fit online instructing structure.
- Record lecture videos, include engaging course content and activities, and design assessments for the course that are suitable online.

Binghamton University January – May 2017
Statistical Consultant

- Provide statistical consultations on study designs, analysis methods, and results interpretations to faculty, research staff, and graduate students in all departments of Binghamton University.

ACADEMIC SERVICE OUTSIDE UNIVERSITY

- Associate Editor (01/01/2023 - 12/31/2023): Journal of Alzheimer's Disease
- Article Reviewer: Aging
- Article Reviewer: PLOS Computational Biology
- Article Reviewer: Journal of Computational Biology
- Article Reviewer: Statistics and Computing
- Article Reviewer: Annals of the New York Academy of Sciences