

# Garrett Frady

## Contact Information

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## Research Interest

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Bayesian methods involving a sparsity inducing prior structure to perform estimation and variable selection in the presence of sparse, high dimensional spatio-temporal data; specifically, neuroimaging data. The goal of my thesis is to combine my assortment of skills obtained through my degrees in math and computer science to develop accurate and efficient methods with novel application.

## Education

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### University of Connecticut

Expected Graduation: May 2024

*Ph.D. in Statistics*

*Storrs, CT*

- Qualifying Exam and General Exam Cleared
- Advisor: Dipak K. Dey

### State University of New York at Potsdam

Date Graduated: May 2019

*B.A./M.A. in Mathematics and B.A. in Computer Science*

*Potsdam, NY*

- Math Master's thesis: Jordan and Rational Canonical Forms of matrices
- Math Master's Advisor: Cornelia Yuen

### Clinton Community College

Date Graduated: May 2016

*A.S. Math and Science*

*Plattsburgh, NY*

## Qualifications and Skills

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### Credentials

- 3 years of experience working with high-dimensional neuroimaging data and high-dimensional Bayesian modeling obtained from my dissertation research under Dr. Dipak Dey
- 4 years of statistical coding experience from the PhD statistics program at the University of Connecticut
- 1 year of experience building R packages as a result of creating my own package for estimation, feature extraction, and prediction applied to electroencephalography data
- Proficient in mathematical statistics, measure theory and probability due to my mathematics background
- Strong communication and team-building skills because of the variety of leadership roles I have held

### Statistical Techniques

- *Bayesian Analysis*: shrinkage and sparsity inducing models, prior specification, MCMC estimation, classification, clustering, model selection
- *Spatio-Temporal Analysis*: structured local modeling, feature extraction and prediction
- *Regression*: Cox proportional hazards, Bayesian, penalized loss, generalized linear mixed-effects models

### Programming Languages and Software

- *R*: proficient through the four years of my PhD program and my research
  - \* Notable packages: ggplot2, tidyverse, dplyr, rstan, parallel, doParallel, foreach
- *Python*: intermediate from machine learning, software engineering projects, and minor personal projects
- *Java* and *C++*: intermediate and beginner, respectively, through my computer science degree
- *SAS* and *SPSS*: exposed through coursework and consulting experience; capable of interpreting output
- *Excel*: competent through coursework, consulting experience, and personal work

## Teaching Experience

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### University of Connecticut

August 2019 - Present

*Department of Statistics*

*Storrs, CT*

- **Primary Instructor**

- \* Large number of students strengthened my ability to present information clearly and concisely
- \* Students from different backgrounds enhanced my ability to provide alternative explanations
- \* Writing recommendation letters for multiple students advanced my writing ability
- \* Improved competence in a leadership role as I was solely in charge of running the courses
- \* Courses:
  - Introduction to Statistics I - Summer 2021, Summer 2022, Fall 2022
  - Introduction to Mathematical Statistics II - Spring 2022

- **Teaching Assistant**

- \* Broadened my collaboration skills from sharing information between the instructor and students
- \* Courses:
  - Introduction to Statistics I - Fall 2019-2022 and Spring 2020-2023
  - Elementary Statistics I - Fall 2021

## Other Experience

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### Statistics Tutor

August 2019 - Present

*University of Connecticut*

*Storrs, CT*

- Student Athlete Success Program (Jan. 2022 - Present): 1-hour weekly sessions with student athletes
- Statistics Department (Aug. 2019 - May 2021): assisted students who came to the tutor room
- Courses: calculus, introduction to statistics, geometry, elementary statistics, mathematical statistics

### UConn Statistical Consulting Services

July 2022 - Present

*Statistical Consultant*

*Storrs, CT*

- **Improving Firefighter Navigation with Haptic Feedback**
  - \* Methodology: Binary logistic regression mixed-effects model
  - \* Used In: Future Research Publication
  - \* Primary Contact: Andrew E. Salter (Ph.D. Candidate, Dept. of Biomedical Engineering)
- **Comparing Outcomes in High-Risk Populations Before and After Adjusting Allocation and Prioritization of Organ Transplants**
  - \* Methodology: Multiple imputation by Fine and Gray competing risk models
  - \* Used In: Future Research Publication
  - \* Primary Contact: William L. Baker, Pharm.D. (Assoc. Prof., Dept. of Pharmacy Practice)
- **Investigating the Role of Erythropoietin on Megakaryocytic-Erythroid Progenitor Survival and Self-Renewal**
  - \* Methodology: "Nroot" sample size calculation approach on the number of donor stem cells
  - \* Used In: Future Research Grant Application
  - \* Primary Contact: Vanessa M. Scanlon, Ph.D. (Assist. Prof., UConn School of Dental Medicine)

### Statistical Research Mentor

May 2023 - Current

*Lumiere Education*

*Remote*

- Paired with students for a 12-week program with the goal of mentoring them through the publication of a research paper
- One student explored the underdiagnosis and undertreatment of ADHD in women compared to men

### R Workshop Instructor

November 2022

*University of Connecticut*

*Storrs, CT*

- Goal: provide base knowledge of the programming language R and user interface RStudio for students from disciplines outside of statistics

### Mathematics Tutor

August 2017 - May 2019

*State University of New York at Potsdam*

*Potsdam, NY*

- Assisted students and groups of students who visited the tutor room for assistance
- Courses: calculus, abstract algebra, real analysis, theory of sets, linear algebra

## *Awards & Honors*

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- Outstanding Performance in Teaching Award** Sep. 2023  
*Department of Statistics at The University of Connecticut*
  - Award for exceptional effort and dedication to teaching
- Certification of Appreciation for Services to the Department** Sep. 2023  
*Department of Statistics at The University of Connecticut*
  - Award for volunteer work in the department
- 3rd Place Poster Award** June 2022  
*International Society for Bayesian Analysis World Meeting*
  - Award for the work I presented at the conference; out of nearly 200 submissions
- Institute of Brain and Cognitive Sciences Affiliate** Mar. 2021 - Present  
*University of Connecticut*
  - Research affiliate with the brain and cognitive sciences program at UConn
- Conference Participation Award** Jan. 2023  
*University of Connecticut*
  - Award from the graduate school for presenting my work at conferences
- Teaching Award** Fall 2020  
*University of Connecticut*
  - Award from the Graduate School for excellence in teaching

## *Research Presentations*

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- International Society for Bayesian Analysis World Meeting** June 2022  
*Montreal, Quebec, Canada*
  - Feature Extraction Performance of the GD Prior in High Dimensional Spatio-Temporal Data
- Joint Statistical Meetings** August 2022  
*Washington D.C.*
  - Bayesian Feature Extraction Using the GD Prior Applied to High Dimensional Spatio-Temporal Data
- UConn Statistics Department 60th Anniversary** October 2022  
*Storrs, CT*
  - Local Bayesian Modeling Approach for Simultaneous Estimation and Feature Extraction with Application to Sparse, High Dimensional Spatio-Temporal Data
- Eastern North American Region Spring Meeting** March 2023  
*Nashville, TN*
  - Performance of the GD Prior in Feature Extraction with Application to Electroencephalography Data

## *Research Papers*

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### **Submitted:**

1. Frady, G., Dey, D. K., Mohammed, S. Gaussian and Diffused-Gamma Feature Extraction Applied to Sparse High Dimensional Spatio-Temporal Data by Local Modeling. *Jornal of Computational and Graphical Statistics*.

### **In Progress:**

2. Frady, G., Dey, D. K., Mohammed, S. Exploring Different Link Functions in Structured Gaussian and Diffused-Gamma Feature Extraction and Prediction with Application to Electroencephalography Data.