Joseph Sartini

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OBJECTIVE

Fifth year Ph.D. candidate motivated to address impactful problems in the applied sciences by combining statistical rigor with adaptable and efficient computing techniques, e.g. Hamiltonian Monte Carlo and machine learning. My recent work has focused on properly and efficiently modelling high dimensional functional and longitudinal data, with applications in cardiovascular epidemiology and international health.

EDUCATION

Ph.D., Biostatistics: **Johns Hopkins Bloomberg SPH, 2021-Ongoing**

Advisors: Dr. Scott Zeger, Dr. Ciprian Crainiceanu, Dr. Liz Selvin

Cardiovascular Epidemiology T32 Trainee

B.S.E., Operations Research and Financial Engineering: **Princeton University, 2021**

Thesis: "Direct Determination of Object Trajectories, an Alternative to Traditional Object Detection and Tracking in Autonomous Vehicles"

Thesis Advisor: Dr. Alain Kornhauser

GPA: 3.94, Highest Honours

RESEARCH

Research Assistant: **Biostatistics Department (Bloomberg SPH), 2021-Ongoing**

Combine statistical and epidemiological perspectives to draw insights from time series data produced by continuous glucose monitoring, accelerometery, ECG, and other wearable sensor modalities, with the goal of producing clinically relevant characterizations.

Journal Club Organizer: **Biostatistics Department (Bloomberg SPH), 2023-25**

Administer recurring peer meetings to discuss papers in the field of functional data analysis, particularly methodological papers laying foundations for efficiently implemented software.

Research Assistant: **Indirect Reciprocity Group (Princeton University), 2020-22**

Assessed the impact of private personal memory on how individuals participate in indirect reciprocity when interacting in a population-wide repeated prisoner's dilemma.

PUBLICATIONS

Sartini, J., Zhou, X., Selvin, L., Zeger, S., & Crainiceanu, C. (in press). Fast Bayesian Functional Principal Components Analysis. *Journal of Computational and Graphical Statistics*.

Sartini, J., Rooney, M. R., Schrack, J., McEvoy, J., Ndumele, C., Zeger, S., Selvin, E., Fang, M. (in press). Light physical activity and all-cause mortality in US adults across Cardiovascular-Kidney-Metabolic Syndrome Stages. *Journal of the American Heart Association*.

Sartini, J., Matabuena, M., & Gude, F. (in press). Multilevel Functional Data Analysis Modeling of Human Glucose Response to Meal Intake. *BMC Medical Research Methodology*

Michel-Mata, S., Kawakatsu, M., **Sartini, J.**, Kessinger, T. A., Plotkin, J. B., & Tarnita, C. E. (2024). The evolution of private reputations in information-abundant landscapes. *Nature*, *634*(8035), 883–889. https://doi.org/10.1038/s41586-024-07977-x

Sartini, J., Fang, M., Rooney, M. R., Selvin, E., Coresh, J., & Zeger, S. (2024). Glucose Color Index: Development and Validation of a Novel Measure of the Shape of Glycemic Variability. *Journal of Diabetes Science and Technology*, 19322968241245654. https://doi.org/10.1177/19322968241245654

Selvin, E., Wang, D., Rooney, M. R., Fang, M., Echouffo-Tcheugui, J. B., Zeger, S., **Sartini, J.**, Tang, O., Coresh, J., Aurora, R. N., & Punjabi, N. M. (2023). Within-person and between-sensor variability in continuous glucose monitoring metrics. *Clinical Chemistry*, *69*(2), 180. https://doi.org/10.1093/clinchem/hvac192

Selvin, E., Wang, D., Rooney, M. R., Echouffo-Tcheugui, J., Fang, M., Zeger, S., **Sartini, J.**, Tang, O., Coresh, J., Aurora, R. N., & Punjabi, N. M. (2023). The Associations of Mean Glucose and Time in Range from Continuous Glucose Monitoring with HbA1c in Adults with Type 2 Diabetes. *Diabetes Technology & Therapeutics*, *25*(1), 86–90. https://doi.org/10.1089/dia.2022.0178

PREPRINTS/SUBMITTED

Sartini, J., Zeger, S., & Crainiceanu, C. (2025). *Bayesian Multivariate Sparse Functional PCA* (No. arXiv:2509.03512). arXiv, under review. https://doi.org/10.48550/arXiv.2509.03512

Zhou, X., Cui, E., **Sartini, J.**, & Crainiceanu, C. (2025). *Prediction Inference Using Generalized Functional Mixed Effects Models* (No. arXiv:2501.07842). arXiv. https://doi.org/10.48550/arXiv.2501.07842

CONFERENCE PRESENTATIONS

"Continuous Glucose Monitoring Data and Precision Medicine"
Diabetes StatClin (April 2025). Presents a frequency-domain based approach to characterizing CGM data useful for phenotyping glycemic dysregulation and predicting comorbid outcomes.

"Joint Associations of Objectively Measured Physical Activity and Cardiovascular-Kidney-Metabolic Syndrome with All-Cause Mortality in US adults"
American Heart Association EPI Lifestyle (March 2025). Examines the potential benefits of lighter-intensity physical activity among those with advanced stage cardiovascular-kidney-metabolic syndrome.

"Bayesian Extension of Multilevel Functional Principal Components Analysis: Accounting for Variability in Eigenfunction Estimation"
International Biometric Society Eastern North American Region (March 2024) and Bayesian Biostatistics Conference (Oct 2024). Presents a novel, efficient implementation of Bayesian Multilevel Functional Principal Components Analysis motivated by continuous glucose monitoring data.

"A Novel Framework for the Extraction and Modelling of Meal-Related Glucose Excursions Detected via Continuous Glucose Monitoring (CGM)"
American Heart Association EPI Lifestyle (March 2024). Introduces a novel procedure for extracting and decomposing subsets of continuous glucose monitoring data related to glucose intake.

"Beyond Mean Glucose: Development of Novel, Reproducible Continuous Glucose Monitoring Metrics"
American Heart Association EPI Lifestyle (March 2023). 16th Annual Bloomberg SPH Gerontology Interest Group Research on Aging Showcase (April 2023). Derives and validates novel metrics, developed using CGM data, related to diabetes status.

COMPETENCIES

- Modelling: longitudinal data, time series, functional data, Bayesian techniques
- Computing: emphasis on readable and scalable software implementations
- Effective communication of complex statistical findings to general audiences
- Understanding of machine learning methodologies in multiple contexts
- Proficient in simulation and optimization
- Experience with R, Julia, Python, C, and Scala in academic and industry settings

TEACHING

Lead Teaching Assistant: **Biostatistics Department (Bloomberg SPH), 2025**
Assists in organizing course materials, provides guest lectures, coordinates and leads weekly labs, and provides office hours for a course on analysis of multilevel and longitudinal data.

Teaching Assistant: **Biostatistics Department (Bloomberg SPH), 2022- 24**
Acted as a teaching assistant for multiple statistical computing courses, with primary responsibility being to assist students in understanding concepts and applications.

TA Training Planning Committee: **Biostatistics Department (Bloomberg SPH), 2023-25**
Assisted in planning, producing, and facilitating the Training Day for Teaching Assistants of biostatistics courses at the outset of the academic year.

Private Tutor: **Biostatistics Department (Bloomberg SPH), 2023-25**
Assisted students in solidifying understanding of core biostatistics course materials prior to comprehensive exams by hosting and organizing small group and one-on-one help sessions.

HONORS AND AWARDS

Louis I. and Thomas D. Dublin Award: **Johns Hopkins University, 2025**
The Louis I. and Thomas D. Dublin Award for the Advancement of Epidemiology and Biostatistics, established by Dr. Thomas Dublin to honor his father Dr. Louis Dublin, supports those students whose research focuses on the effective use of statistical reasoning and methods in epidemiology.

Helen Abbey Award: **Johns Hopkins University, 2024**
The Helen Abbey Award, established by friends, faculty, colleagues, and former students of Dr. Abbey, ScD '51, celebrates her long tenure with the Department of Biostatistics. The award honors a Biostatistics student in the second year or higher who has shown a commitment to teaching after graduation.

Ahmet S. Çakmak Prize: **Princeton University, 2021**
Recognizes innovative research and an exceptional senior thesis.

George J. Mueller Award: **Princeton University, 2021**
Honours the undergraduate seniors combining high scholarly achievement in the study of engineering with quality performance in intercollegiate athletics.

Shapiro Award: **Princeton University, 2019**
Award established to encourage and honour engagement in intellectual pursuits by first- and second-year students.

PROFESSIONAL EXPERIENCE

Software Engineering Intern: **PrivacyStar (First Orion Corporation), 2019**
Utilized Apache Spark and AWS for cluster computing applications on large telecom datasets. Interacted intensively with SQL server to evaluate performance.

Volunteering

Fostering Diversity in Biostatistics Workshop Computing Session Volunteer, ENAR 2024

March of Dimes Walk Volunteer, Premie Paraders UAMS Team, Virtual, 2016-2020

Prenatal Loss Day of Remembrance Volunteer, University of Arkansas for Medical Sciences, NICU, 2014 and 2020

Neonatal ICU Families Reunion and Special Events Volunteer, University of Arkansas for Medical Sciences, 2013-2016

REFERENCES UPON REQUEST