# Samuel Anyaso-Samuel


CONTACT INFORMATION

Biostatistics Branch
Division of Cancer Epidemiology & Genetics
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RESEARCH INTERESTS

Cluster-correlated data analysis, Informative Cluster Size, Univariate and Multivariate time-to-event data, Statistical Process Control, Longitudinal microbiome data, Biological networks

PROFESSIONAL EXPERIENCE

**Postdoctoral Research Fellow** **September 2023 - Present**
Biostatistics Branch,
Division of Cancer Epidemiology & Genetics,
National Cancer Institute, Rockville, MD, USA

**Biostatistician** **August 2020 - August 2023**
Brain Rehabilitation Research Center,
NF/SG VHS Malcolm Randall VA Medical Center, Gainesville, FL, USA

**Graduate Research and Teaching Assistant** **August 2019 - August 2023**
Department of Biostatistics,
University of Florida, Gainesville, FL, USA

**Graduate Teaching Assistant** **August 2017 - May 2019**
Department of Mathematics,
Boise State University, Boise, ID, USA

EDUCATION

**University of Florida**, Gainesville, FL, USA
Doctor of Philosophy (Ph.D.), Biostatistics **August 2023**

- Thesis Topic: *Advances in cluster-correlated data analysis when cluster size is informative*
- Advisor: Somnath Datta, Ph.D.

**Boise State University**, Boise, ID, USA
Master of Science (M.S.), Mathematics **May 2019**

- Thesis Topic: *Dynamic Sampling Versions of Popular SPC charts for Big Data Analysis*
- Advisor: Partha Mukherjee, Ph.D.
- Area of Study: Statistics

**Federal University of Technology, Owerri**, Nigeria
Bachelor of Technology (BTech.), Statistics **December 2014**

- Thesis Topic: *Some contributions to the interpretation of Fuzzy Regression Intervals*
- Advisor: Benson Onoghojobi, Ph.D.

HONORS AND AWARDS

- 2023 Lifetime Data Science Conference - Student Poster Award (June 2023).
- 2023 Symposium on Data Science & Statistics - Student & Early Career Travel Award (May 2023).
- 2023 Fostering Diversity in Biostatistics (ENAR) - Student Scholarship (March 2023).
- DEI Poster Award (Data Science); 2022 College of Medicine Research Day (April 2022).
- UF Department of Biostatistics PhD Travel Award (March 2022).
- 2020 Intelligent Systems for Molecular Biology - Fellowship Award (July 2020).
- 2019 JSM Diversity Workshop and Mentoring Program - Student Scholarship (July 2019).

- 36th ASA Quality & Productivity Research Conference - Student Scholarship (June 2019).
- 2019 ASA/IMS Spring Research Conference - Student Scholarship (May 2019).
- Best Poster; Workshop on Emerging Data Science Methods for Complex Biomedical and Cyber Data, *Department of Population Health Sciences, Medical College of Georgia* (March 2019).
- Best Poster from College of Engineering; Boise State University service-learning student exhibition, *Boise State University* (Dec. 2018).
- ACM Richard Tapia Celebration of Diversity in Computing Conference Scholarship (Sept. 2018).
- Student Representative, American Statistical Association, *Boise State University* (June 2018).
- Graduate Summer Fellowship, Department of Mathematics, *Boise State University* (May 2018).
- Alfred M. Dufty Jr. Award, *Boise State University* (May 2018).
- Computing Research Association (CRA) Sponsorship for CRA URMD workshop (March 2018).
- Graduate Residential Scholars Program, *Boise State University* (Aug. 2017).

## PUBLICATIONS

6. **Anyaso-Samuel S.**, and Datta S. Testing for marginal covariate effect when the subgroup size induced by the covariate is informative. *Submitted*, (2023+).

5. Ubeira Gebel L., Machin Santana T., Rodriguez A., Singh S., Fernandez M., Dalugdug J., Garcia-Colon E., Lybeshari K., Alexander D., Maura M., Cabrera Gonzalez M., Almeida C., **Anyaso-Samuel S.**, Leinen M., Grandy E., Datta S., and Schiefer M. Bilateral subdiaphragmatic vagal nerve stimulation using a novel waveform decreases body weight, food consumption, adiposity, and activity in rats on a high fat diet. *Obesity Surgery (under revision)*, (2023+).

4. **Anyaso-Samuel S.**, Bandyopadhyay D, and Datta S. Pseudo-value regression of clustered current status data with informative cluster or subcluster sizes in a multistate model. *Statistics Methods in Medical Research*, 32(8):1494-1510, (2023).

3. **Anyaso-Samuel S.**, and Datta S. Adjusting for informative cluster size in pseudo-value based regression approaches with clustered time-to-event data. *Statistics in Medicine*, 42(13): 2162-2178 (2023).

2. **Anyaso-Samuel S.**, Sachdeva A., Guha S., and Datta S. Bioinformatics preprocessing of microbiome data with an application to metagenomic forensics. In *Statistical Analysis of Microbiome Data*, (pp. 45-78), Eds: S. Datta and S. Guha, Springer (2021).

1. **Anyaso-Samuel S.**, Sachdeva A., Guha, S., and Datta S. Metagenomic geolocation prediction using an adaptive ensemble classifier. *Frontiers in Genetics, 12*, p.642282 (2021)

## OTHER ABSTRACTS

3. Ashby F., **Anyaso-Samuel S.**, Gamlin P., Kabbej N., Andraka N., Mandel R., Riva A., Datta S., Heldermon C. AAV-barcoding for High-throughput Screening of Vector Transduction Efficiency in the CNS of Cynomolgus Macaques Compared to C57BL/6 Mice. *Florida Genetics Symposium*, Gainesville, FL, (Nov. 2022).

2. Kabbej N., Ashby F.J., Riva A., **Anyaso-Samuel S.**, Datta S., Heldermon C.D. Transcriptomic Disparities Between Male and Female Non-Human Primates Related to AAV Transduction Efficiency. *American Society of Gene & Cell Therapy (ASGCT) 25th Annual Meeting*, Washington DC, (May 2022).

1. Ashby F., Kabbej N., Riva A., Rouse C.J., Hawkins K., Andraka N., **Anyaso-Samuel S.**, Gamlin P., Mandel R., Kondratov O., Zolotukhin S., Datta S., Heldermon C. Genetic Barcoding Identifies Similar Transduction Efficiency Rankings within Disease Models of Sanfilippo Syndrome Type-B and Controls. *19th Annual WORLDSymposium*, Orlando, FL, (Feb. 2022).

PRESENTATIONS

**Invited, Refereed & Seminar Talks**

- Regression analysis for clustered multistate current status data using the pseudo-value approach, *2023 Symposium on Data Science & Statistics*, ST. LOUIS, MO (May 2023).
- Regression analysis of clustered time-to-event data when the cluster size is informative: a pseudo-value approach, *Department of Epidemiology and Biostatistics, West Virginia University* (March 203).
- Pseudo-value-based regression analysis of clustered multistate time-to-event data when the cluster size is informative, *Biostatistics Branch, National Cancer Institute* (March 2023).
- Regression analysis of clustered time-to-event data when the cluster size is informative, *Division of Computing, Analytics, and Mathematics, University of Missouri*, KANSAS CITY (February 2023).
- Regression analysis of clustered time-to-event data when the cluster size is informative, *UFSTAT Student Seminar Series*, GAINESVILLE, FL (February 2023).
- Bioinformatics Pre-processing of Microbiome Data with an Application to Metagenomics Forensics, *2021 Joint Statistical Meetings*, VIRTUAL CONFERENCE (August 2021).
- Metagenomic Geolocation Prediction Using an Adaptive Ensemble Classifier, *28th Conference on Intelligent Systems for Molecular Biology*, VIRTUAL CONFERENCE (July 2020).
- Fuzzy Regression Intervals, Graduate Student Seminar, *Department of Mathematics, Boise State University*, BOISE, ID (December 2017).

**Conference Talks**

- Regression analysis of multistate current status data with informative cluster sizes: a pseudo-value approach, *UF PHHP Research Day 2023*, GAINESVILLE, FL (February 2023).
- Adjusting for Informative Cluster Size in Pseudo-Value-Based Regression Approaches with Clustered Time-to-Event Data, *2022 Joint Statistical Meetings*, WASHINGTON DC (August 2022).
- Pseudo-value based regression for clustered time-to-event data when cluster size is informative, *UF PHHP Research Day 2022*, VIRTUAL CONFERENCE (February 2022).
- Bioinformatics Pre-processing of Microbiome Data with an Application to Metagenomics Forensics, *UF PHHP Research Day 2021*, VIRTUAL CONFERENCE (February 2021)

**Posters**

- Pseudo-Value Regression of Clustered Current Status Data with Informative Cluster or Subcluster Sizes in a Multistate Model, *2023 Lifetime Data Science Conference*, RALEIGH, NC (May 2023).
- Pseudo-Value Regression of Clustered Current Status Data with Informative Cluster or Subcluster Sizes in a Multistate Model, *2023 Annual ASA Florida Chapter Meeting*, GAINESVILLE, FL (March 2023).
- Pseudo-Value Regression of Clustered Current Status Data with Informative Cluster or Subcluster Sizes in a Multistate Model, *ENAR 2023 Spring meeting*, NASHVILLE, TN (March 2023).
- Pseudo-value based regression for clustered time-to-event data when cluster size is informative, *2022 International Chinese Statistical Association (ICSA) Applied Statistics Symposium*, GAINESVILLE, FL (June 2022).
- Pseudo-value based regression for clustered time-to-event data when cluster size is informative, *UF College of Medicine Research Day 2022*, GAINESVILLE, FL (April 2022).
- EWMA Control Chart with a Dynamic Sampling Scheme, *2019 Quality and Productivity Research Conference*, WASHINGTION D.C. (June 2019).

- Dynamic Sampling Versions of Popular SPC charts for Big Data Analysis, *2019 IMS/ASA Spring Research Conference*, BLACKSBURG, VA. (May 2019).
- Statistical Process Control Charts for Monitoring Big Data Streams, *Workshop on Emerging Data Science Methods for Complex Biomedical and Cyber Data*, AUGUSTA, GA. (March 2019).
- Using Data Science to help Idaho cities make hiring decisions, *Boise State University Service-learning student exhibition*, BOISE, ID. (December 2018).
- Some contributions to the interpretation of Fuzzy Regression Intervals, *Computing Research Association URMD Workshop*, SAN DIEGO, CA. (March 2018).

## GRANTS

3. **U.S. Department of Veterans Affairs IPA**, "Brain Rehabilitation Research Projects". September 2022 - August 2023. Role: Principal Investigator (Mentor: Somnath Datta; VA PIs: D. Clark, R. M. Bauer).
2. **U.S. Department of Veterans Affairs IPA**, "Brain Rehabilitation Research Projects". September 2021 - August 2022. Role: Principal Investigator (Mentor: Somnath Datta; VA PIs: D. Clark, R. M. Bauer).
1. **U.S. Department of Veterans Affairs IPA**, "Brain Rehabilitation Research Projects". September 2020 - August 2021. Role: Principal Investigator (Mentor: Somnath Datta; VA PIs: D. Clark, R. M. Bauer).

## SOFTWARE

5. **Anyaso-Samuel S.** and Datta S. **crspack** R package to conduct inference based on rank-sum statistics for cluster-correlated data with informativeness of the total cluster size, informativeness of a binary covariate distribution or informativeness of a subject-level covariate distribution.
4. **Anyaso-Samuel S.**, Bandyopadhyay D., and Datta S. **mspack2**. R package for estimating several temporal functions (e.g. state occupation probabilities) for current-status data from of a general multistate model. The code estimates the SOP for the setting where the current-status data is either uncorrelated or cluster-correlated.
3. **Anyaso-Samuel S.** and Datta S. **pseudoReg-ICS**. R program for estimating the state occupation probability for cluster-correlated data from a multistate model. The program allows for adjusting for informative cluster size.
2. **Anyaso-Samuel S.**, Sachdeva A., Guha S., and Datta S. **metagenomic_data_analysis** Suite of programs for the bioinformatics pre-processing and downstream analysis of raw sequence metagenomics data.
1. **Anyaso-Samuel S.**, and Mukherjee P. **DyAEWMA** R package for estimating the average time to signal (ATS) of an adaptive EWMA chart with a dynamic sampling scheme or the average run length (ARL) of the adaptive EWMA chart.

## TEACHING EXPERIENCE

**Department of Biostatistics**, University of Florida

*Instructor* **Fall 2022**

- STA 6177 - Applied Survival Analysis.

*Guest lecturer* **Spring 2021, Spring 2022**

- PHC 7066: Large Sample Theory.
  - Gave lectures on *Modes of convergence* and *Asymptotic normality of the MLE* to PhD students.

*Teaching Assistant* **Fall 2019 - Summer 2023**

- PHC 6937: Bayesian Biostatistical Methods
- PHC 6089: Pubic health computing
- PHC 6937: Fontiers in Biostatistics
- PHC 6937: Introduction to Applied Biostatistical Computing Using SAS
- PHC 6052: Introduction to Biostatistical Methods
- PHC 6937: Data Visualization in the Health Sciences
- PHC 6092: Introduction to Biostatistical Theory

**Department of Mathematics**, Boise State University

*Instructor* **Fall 2017, Fall 2018, Spring 2019**

- MATH 149: Pre-Calculus.
- MATH 108: Intermediate Algebra.

*Tutor* **Spring 2018**

- Tutored students enrolled in *Intermediate Algebra*, *College Algebra* and *Pre-calculus* classes.

## Consulting Experience

**Division of Hematology and Oncology**, University of Florida **Aug. 2021 - Aug. 2023**

Provided statistical support for a study funded by the NIH grant (1R01NS102624-01) titled "Optimizing AAV Vectors for Central Nervous System Transduction" (PI: Coy Heldermon).

- Designed a suitable pipeline for the bioinformatics pre-processing of raw sequenced reads.
- Performed statistical analyses for analyzing mRNA and DNA profiles from different animal models. Primary statistical analyses include nonparametric tests, rank aggregation, and correlation analyses.
- Utilized modern machine learning techniques from data visualization software to provide statistical graphics.

Departments of **Psychiatry** and **Clinical Psychology**, University of Florida **Jan. 2021 - Aug. 2023**

Provided statistical support for various research projects by Dr. John Williamson, Dr. David Clark, and their trainees.

- Developed statistical models to analyze longitudinal and high-dimensional cross-sectional data sets. Primary statistical analyses involved mixed effects modeling and penalized regression modeling.
- Developed computer programs for data visualization.
- Conducted power & sample size analyses and wrote the statistical plan for two grant proposals funded by the NIH.

**U.S. Department of Veterans Affairs**, Gainesville, FL USA **Aug. 2020 - Aug. 2023**

Provided analytical support for the Brain Rehabilitation Research Center (BRRC) housed at the VA.

- Performed statistical analyses for more than 10 different projects and grant proposals. Primary statistical analyses involved power and sample size calculations, regression analysis, analysis of variance, multivariate analysis of variance, and correlation analysis.
- Wrote the statistical plan section for four grants submitted by BRRC members to the Department of Veterans Affairs.
- Constant communication with clinicians and physicians on statistical design and methodologies for ongoing projects.

## Professional Development

**Preparing Future Faculty**

*Center for Teaching Excellence, University of Florida* **Aug. 2022 - Dec. 2022**

- Competitive and selective semester-long workshop focused on preparing participants for future careers in various academic settings.
- Devoted emphasis on evidence-based teaching, learning practices, expanding mentoring team, and strategies for being a successful faculty member.

## SERVICE

**Journal Review**

- Lifetime Data Analysis (1)
- Journal of Applied Statistics (2)
- Statistical Methods in Medical Research (2)

**Conference Session Chair**

- *2023 Eastern North American Region, Spring meeting* — Clustered data methods
- *2023 Symposium on Data Science & Statistics* — Methods in Health & Medical Research

**University Service (University of Florida)**

- *Member*, Student recruitment committee; Department of Biostatistics (Nov. 2021 - Present).
- *Vice President*, Biostatistics Students' Organization (Sept. 2021 - Sept. 2022).
- *President*, Biostatistics Students' Organization (Sept. 2022 - April 2023).

## PROFESSIONAL MEMBERSHIPS

American Statistical Association (ASA) 2018 - Present

- Lifetime Data Analysis Section
- Biometrics Section
- Biopharmaceutical Section
- Section on Statistics in Epidemiology
- Quality and Productivity Section

Royal Statistical Society (RSS) 2014 - Present
Institute of Mathematical Statistics (IMS) 2014 - Present
International Biometric Society, Eastern North American Region (ENAR) 2022 - Present
International Chinese Statistical Association (ICSA) 2022 - 2023
International Society for Computational Biology (ISCB) 2020 - 2021
Mathematical Association of America (MAA) 2017 - 2019

## COMPUTER SKILLS

**General Software**

- *Operating systems.* WINDOWS, LINUX and MACOS.
- *Productivity applications.* Advanced skills in WORD, EXCEL, and POWERPOINT.

**Computing & Programming**

- `Parallel Computing` in selected scripting languages.
- Extensive experience with **R**/RStudio, **C++**, MATLAB, PYTHON, LaTeX.
- Intermediate experience with SAS, STATA, SPSS.
- `Version control`: GitHub user @samuelanyaso

**Bioinformatics**

- Extensive experience in building pipelines for pre-processing and analysis of large-scale sequencing data.
- Downstream analysis of -omics data.

## REFEREES

**Available upon request.**