Emmanuel Adjei

+1(949)-992-4661 | eadjei@uci.edu/eadjei@aims.edu.gh | LinkedIn | GitHub | Youtube | Website | USA

Education

University of California, Irvine (UCI) — CA-USA
Master of Science in Statistics — *Sep 2022 – Present*

- **Relevant coursework:** Machine Learning, Introduction to Probability & Statistical Theory, Causal Inference, Stochastic Process, Data Science, Bayesian Statistics, Statistical Computational Methods and Applied Engineering Mathematics.

African Institute for Mathematical Sciences, University of Ghana (UG) — Accra, Ghana
Master of Science in Mathematical Sciences — *Aug 2021 – Jun 2022*

- **Relevant coursework:** Functional Analysis, Concepts of Physics and Physical Problem Solving, Complex Networks, Information Theory, Python Programming, Differential Equations, Advanced Numerical Analysis and Scientific Computing with Python, Category Theory, Dynamical Systems, Entropy Decay in Markov Chains and Noncommutative Algebra and Geometry.

Kwame Nkrumah University of Science and Technology (KNUST) — Kumasi, Ghana
Bachelor of Science in Statistics (First Class) — *Aug 2016 – Aug 2020*

- **Relevant coursework:** Scientific Computing, Mathematical Programming, Calculus I-II, Differential Equations, Numerical Methods, Probability & Statistics, Introduction to measure and Probability Theory , Scientific Research & Communication, Linear Algebra, Abstract Algebra, Real Analysis, Partial Differential Equations and Actuarial Statistics.

Work & Volunteer Experience

University of California, Irvine — Ca, USA
Reader & TA Position — *Sep 2022 – Aug 2024*

- In my current role as a Teaching Assistant/Reader at the Department of Statistics, Donald Bren School of Information and Computer Sciences, UCI, I support courses such as Basic Statistics (STAT 7), Introduction to Probability and Statistics, STATS 120A, STATS 120B, and Statistical Methods for Data Analysis.
- I leverage various teaching and grading software including Gradescope, Macmillan Learning, Perusall, and Ed Discussion to facilitate effective student assessment and feedback.
- My responsibilities include conducting tutorial sessions, grading assignments, and providing comprehensive feedback to students to enhance their understanding of statistical concepts.

Kwame Nkrumah University of Science and Technology — Kumasi, Ghana
Research & Teaching Assistant – Department of Mathematics — *Aug 2020 – Sep 2022*

- Tutored undergraduate students in courses including Differential Equations, Calculus I-II, Numerical Methods, Real Analysis, Partial Differential Equations, and Linear Algebra. This involved conducting tutorial sessions, grading assignments, and offering office hours to address student queries. I also collaborated closely with supervisors to design course materials and exams, ensuring that the content was appropriately challenging and aligned with the learning objectives of the courses.
- Worked with faculty members on research projects for final-year undergraduate students. The projects included applying numerical methods to solve complex mathematical problems, studying differential equations to model real-world phenomena, and exploring advanced concepts in Differential Equations .

Young People We Care (YPWC) — Kumasi, Ghana
Logistic Officer — *Aug 2016 – April 2018*

- Conducted public education sessions on the Sustainable Development Goals (SDGs) in Ghana for high school students and the community, supervised by United Nations Information Centres (UNICs).

Church of Christ Senior High School — Kumasi, Ghana
Intern-Mathematics Tutor — *Aug 2015 – April 2017*

- Tutored students in Elective (Vectors and Mechanics, Calculus & Probability and Statistics) and Core Mathematics (Matrix Algebra and Plane Geometry) to prepare them for the West African Senior School Certificate Examination (WASSCE).

Academic Research Experience

Graduate Research

A Regression Method Estimation of the Extreme Value Index Using Decreasing Dependent Random Weights *(link)*

- We proposed a reduced-bias estimator of the Extreme Value Index (EVI) for Pareto-type distributions using a random weight and approximate deterministic weight function.
- Using the Condroz and Secura Belgian reinsurance data set, we compared the performance of the proposed estimator with that of other existing semi-parametric tail index estimators available in the literature.
- Overall, the WLS estimator typically results in lower bias and mean squared error (MSE) for intermediate and large values of k (data points), making it a suitable estimator for the extreme value index of samples from Pareto-type distributions. Additionally, the proposed estimator was shown to be unbiased, consistent, and asymptotically normal.

Undergraduate Research

A regression analysis on the impact of macroeconomic variables and banking characteristics on lending interest rate *(link)*

- A multiple linear regression analysis was used to evaluate the impact of these variables on lending interest rates.
- The study revealed that GDP growth rate, inflation rates, monetary policy rates, and treasury bill rates had no significant effect on lending interest rates during the study period.
- We recommend that both domestic and international investors factor in the relationship between exchange rates and lending interest rates when making long-term investment decisions.

Awards & Achievements

Department of Statistics, (UCI) Assistantship Award: This award was useful throughout my graduate education at the University of California, Irvine.

Master's in Mathematical Sciences Scholarship (General AIMS Bursary): Awarded by the African Institute for Mathematical Science in collaboration with the Ghana Government to talented postgraduate students from the African continent. This award was extremely useful throughout my graduate education at AIMS-Ghana.

University Of Colorado Boulder tidyverse for data science certification: Awarded for successfully completing the "R for Tidyverse for Data Science" course. Achieved proficiency in data importing, cleaning, testing, transforming, visualizing, and model building.

Projects

Online Chinese Restaurant Process | *Adaptive Learning, Nonparametric, Online Learning* (link)

- Reviewed and presented the Online Chinese Restaurant Process as introduced by Chien-Liang Liu, Tsung-Hsun Tsai, and Chia-Hoang Lee.
- The proposed method incorporates a relaxing function within the prior, adjusting parameters based on the consistency between true labels and predicted results.
- Experimental results demonstrate that the online CRP performs efficiently and effectively on large-scale datasets, such as Wikipedia with approximately two million documents, outperforming several other online and batch learning algorithms.

The Mathematical Principles Behind OpenAI's SORA | *Diffusion Probabilistic Models, ViT, Random Noise* (link)

- Explored the mathematical and architectural foundations that underpin advancements in generative modeling, particularly in extending the principles behind image generation.
- Introduced temporal extension to address the complexity of motion, enabling generative models to capture and generate dynamic scenes.

Introductory Lessons on Partial Differential Equations on YouTube | *Transport, Heat, and Wave Equations* (link)

- Explored a step-by-step analytical approach to introductory PDE questions at the undergraduate level.
- Provided detailed solutions to problems involving classifications, transport, wave, and heat equations.

Computing Skills

Programming: Python, Mathematica, MATLAB, R, SQL.

Technologies: git, Unix Shell, LaTeX, Tableau, Power Bi.

Libraries: Scikit-Learn, Pytorch, Numpy, Scipy.

Other Skills: Strong verbal and written communication skills, exceptional problem-solving skills and good teams skills.

References

Hengrui Cai, Ph.D.
University of California, Irvine (UCI)
hengrc1@uci.edu
919-961-2405

Lee Kucera, Ph.D.
University of California, Irvine (UCI)
lkucera@uci.edu
949-422-7567

Gaston Edem Awashie, Ph.D.
Kwame Nkrumah University of Science and Technology (KNUST)
geawashie@knust.edu.gh
+233 209 219 708

Reindorf Nartey Borkor, Ph.D.
Kwame Nkrumah University of Science and Technology (KNUST)
reinbork@gmail.com
+233 544 714 398