Benjamin Osafo Agyare

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EDUCATION

PhD Statistics 2021 - 2026
University of Michigan, Ann Arbor, MI, USA

MS Statistics and Data Science 2019 - 2021
University of Nevada, Reno, NV, USA

Certificate in Teaching Practice in Higher Education 2020 - 2021
Association of College and University Educators (ACUE), USA

BS Actuarial Science 2013 - 2017
Kwame Nkrumah University of Science and Tech., Ghana
Honors First Class

RESEARCH INTERESTS

Statistical Machine Learning, Computational Statistics, Network Analysis, Bayesian Analysis

TEACHING

- **Graduate Student Instructor**, *University of Michigan, Ann Arbor*
  - **STATS 406 - Computational Methods in Data Science** ($\sim$ 77 students) *Fall 2021*
- **Graduate Teaching Assistant**, *University of Nevada, Reno*
  - **MATH 127 - Pre-Calculus II** ($\sim$ 70 students) *Spring 2021*
  - **MATH 181 - Calculus I** ($\sim$ 90 students) *Fall 2020*
  - **MATH 126 - Pre-Calculus I** ($\sim$ 140 students) *Fall 2019*
- **Teaching Assistant**, *University of Ghana*
  - **STAT 224 - Introductory Probability II** ($\sim$ 60 students) *Spring 2018*
  - **STAT 222 - Data Analysis I** ($\sim$ 95 students) *Spring 2018*
  - **STAT 221 - Introductory Probability I** ($\sim$ 60 students) *Fall 2017*
  - **ACTU 409 - Introduction to Actuarial Mathematics** ($\sim$ 140 students) *Fall 2017*

WORKING

- **Summer Actuarial Intern**, *CAS Student Central* *Sept 2018 - July 2019*
  - Casualty Actuarial Society P&C training in:
    - Ratemaking • Reserving • Predictive Modeling • Data Visualization
- **Predictive Modeling Intern**, *Employers Insurance Group* *May 2020 - Aug 2020*
  - Performed Territorial Analysis on claim frequencies using Spatially Constrained Clustering Algorithms and Generalized Additive Models to re-cluster rating territories for refining pricing models
  - Built Loss Development Models to estimate future losses using Elastic-Net Poisson GLM
  - Built Pure Premium models using GLMs and Zero-Inflated Models to predict future loss costs.

- **Math Instructor**, *International Community School, Ghana* *Sept 2018 - July 2019*
  - Taught Cambridge O and A Level Mathematics to prepare students for the IGCSE exams.
  - Rated distinction in teaching within first 3 months into the job.

RESEARCH AND PROJECTS

- Pricing A European Call Option Using the Geometric Brownian Motion and Monte Carlo Methods, *University of Nevada, Reno* *Spring 2020*
  - Used Geometric Brownian Motion to predict stock prices and priced European call option on the stocks using Monte Carlo simulations (in R) (slide)
  - Techniques adopted include: *Geometric Brownian Motion (GBM), Stochastic Differential Equations (SDEs), Monte Carlo Simulation, Options Greek*
- A Bayesian Hierarchical Model for US Election Data, *University of Nevada, Reno* *Spring 2020*
  - Modeled US election results and estimated the partisan lean for all 50 states using election data from 1992 to 2018 (in R) (poster)
  - Techniques adopted include: *Hierarchical Bayesian Modeling, Markov Chain Monte Carlo (MCMC), Rstanarm*
- Boston Crime Data Analysis: Monthly Prediction with Autoregressive Integrated Moving Average and Gaussian Process Regression (GPR), *University of Nevada, Reno* *Spring 2020*
  - Predicted total monthly crimes using Boston Crime Data from June 2015 to September 2018 (in R) (poster)
  - Techniques adopted include: *Gaussian Process Regression (GPR), Autoregressive Integrated Moving Average (ARIMA) —Specifically the AR(p) Model*
- A Survival Analysis of The Surrender of Life Policies of Life Insurance Companies in Ghana (A Case Study of SIC Life), *Kwame Nkrumah Univ. of Sci. and Tech, Kumasi, Ghana 2016 - 2017*
  - Calculated survival probabilities for policy surrendering and identified factors affecting policy surrenders. (slide)
  - Techniques adopted include: *Survival Modeling, Kaplan-Meier Estimator, Cox-Proportional Hazards Model*

WORKING PAPERS

1. Andrey Sarantsev, A. Grant Schissler, Benjamin Osafo Agyare and Alex Knudson, *Partisan Lean of States: Electoral College And Popular Vote*

COMPUTING SKILLS

Programming/Scripting Languages
R, PYTHON, SAS, SQL, C++ *(beginner)*

Operating Systems
WINDOWS, LINUX

Reproducible Research/Publishing
LaTeX, R MARKDOWN, MS WORD, GIT

ACTUARIAL EXAMS

- **SOA Exams: F**inancial **M**athematics, **P**robability, **S**tatistics for **R**isk **M**odeling
- **VEE: Applied Statistical Methods, Economics, Corporate Finance**

PROFESSIONAL ENGAGEMENTS

- ***Student Member***, Royal Statistical Society (RSS)
- ***Student Member***, Society of Actuaries (SOA)
- ***Member***, International Association of Black Actuaries (IABA)
- ***Member***, CAS Student Central

HONORS & AWARDS

- **IABA Foundation Scholar** (2021)
- **Graduate Awards**
  - Spring 2020, ***1st Place***, Capstone Project Competition in Bayesian Statistics, The University of Nevada, Reno
  - Fall 2019, ***1st Place***, Capstone Project Competition in Statistical Computing, The University of Nevada, Reno
- **Undergraduate Student Awards**
  - January 2017, ***1st Place***, KNUST Actuarial Club Annual Interclass Quiz Competition

MASSIVE OPEN ONLINE COURSES (MOOCS)

Course(*on Coursera*)	**Institution**	**Date**
Bayesian Statistics: From Concept to Data Analysis (with Honors)	*Univ. of California, Santa Cruz*	March 2018
Bayesian Statistics: Techniques and Models (with Honors)	*Univ. of California, Santa Cruz*	July 2018
Practical Time Series Analysis	*State University of New York*	July 2018
Designing, Running, and Analyzing Experiments	*Univ. of California, San Diego*	July 2018
Financial Markets (with Honors)	*Yale University*	June 2018

RELEVANT COURSEWORK

University of Nevada, Reno

Probability, Statistical Theory, Stochastic Processes and Simulation, Applied Regression, Multivariate Data Analysis, Bayesian Statistics, Categorical Data Analysis, Statistical Computing, Statistical Learning (Spring 2021), Computational Statistics (Spring 2021).

Kwame Nkrumah University of Science and Technology

Mathematics: *Pure Math (Calculus), Real Analysis, Vector Analysis, Linear Algebra, Differential Equations, Numerical Methods and Computation (Using MathLab), Discrete Math, Logic and Set Theory*

Statistics: *Probability and Statistics, Stochastic Processes, Operations Research, Time Series Analysis, Regression Analysis, Design of Experiments, Analysis of Survival Data, Statistical Methods for Process Improvement, Demographic Statistics, Sample Survey Theory.*

Actuarial: *Mathematical Models in Finance, Asset Liability Management, Mathematics of Finance and Investment, Mathematical Corporate Finance, Elements of Economics, Financial Accounting, Actuarial Mathematics, Loss Models*