

# Sarah Mensah

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## PROFESSIONAL SUMMARY

Dedicated statistics graduate student passionate about solving real-world problems using advanced statistical methods and machine learning. Experienced in regression analysis, predictive modeling and Bayesian methods, with a strong interest in health related data. I bring hands-on research expertise and a collaborative spirit.

## WORK EXPERIENCE

### Montana State University • Bozeman, MT

08/2022 - Present

#### Graduate Researcher

- Conducted statistical analysis of microcalorimeter data to study chondrocyte heat generation which revealed insights into cellular metabolism and cartilage degradation.
- Applied a Generalized Least Squares (GLS) model to account for non-constant variance which helped to accurately assess the differences in total heat generation across cell groups.
- Led initial findings to a manuscript submission within 4 months and currently expanding the research through functional data analysis to examine heat generation curves over time.

#### Graduate Teaching Assistant

- Provided instruction on data wrangling, visualization, and hypothesis testing while guiding students to perform statistical analysis and derive data-driven conclusions.
- Collaborated with students during lab sessions and office hours to clarify statistical concepts and guide effective use of R programming for assignments and projects.

#### Statistical Consultant

- Applied statistical methodologies including mixed-effects models to assess survey responses and analyzed the impact of storybook-based Alzheimer's education across age groups.
- Clearly communicated statistical methods to clients which ensured transparency and lead to informed decisions for program recommendations and development.

#### Graduate Research Assistant

- Explored dimensionality reduction techniques, including sparse PCA, to enhance interpretation and analysis of high-dimensional metabolomics data for early osteoarthritis diagnosis.
- Investigated sparse contrastive PCA to reduce the dimensionality of metabolomics data, making it manageable and useful for identifying early molecular markers of osteoarthritis.

### KPMG • Australia (Remote)

07/2020 - 08/2020

#### Data Analytics Intern

- Identified data quality issues with the dataset presented by the Sprocket Central company and created visualizations to help the company better understand its customers.
- Used RMF (Recency, Frequency & Monetary) analysis to help the company determine which customers it should target to increase its revenue (by about 15%) and customer lifetime value.

EDUCATION

Ph.D. Statistics

Montana State University • Bozeman, MT • GPA: 3.9

Expected: December 2027

M.S. Statistics

Montana State University • Bozeman, MT • GPA: 3.89

05/2024

B.S. Actuarial Science

Kwame Nkrumah University of Science and Technology • Kumasi, Ghana • GPA: 3.89

09/2021

AWARDS & SCHOLARSHIPS

Academic Excellence Scholarship Receipient

05/2021

Ghana Scholarship Secretariat

VOLUNTEERING & LEADERSHIP

Actuarial Science Students' Association-KNUST Chapter

09/2020 - 08/2021

Judicial Committee Chair

Actuarial Science Students' Association of Ghana

09/2019 - 05/2020

Deputy Finance Chair

PUBLICATIONS

Modeling of the Daily Dynamics in Bike Rental System Using Weather and Calendar Conditions: A Semi-Parametric Approach

06/2024

Scientific African

Proposed a robust method using penalized splines quasi-Poisson regression to model bike rentals, revealing hidden relationships not identified by traditional parametric models which informed future transportation strategies.

Predictive Analysis of Misuse of Alcohol and Drugs using Machine Learning Algorithms: The Case of using an Imbalanced Dataset from South Africa

03/2023

Appl. Math

Compared six supervised machine learning algorithms to predict alcohol and drug abuse across South Africa's nine provinces, proposing an optimal predictive model.

SKILLS

Programming Languages: Python, R programming (R Markdown, RStan, JAGS), SAS

Database: SQL

Project Management: Git/GitHub

Data Visualisation: Tableau