**SARAH FOBI MENSAH**

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# RESEARCH INTERESTS

High dimensional data analysis (particularly in health-related applications), functional data analysis, dimensionality reduction techniques, regression modeling and machine learning.

# EDUCATION

**Ph.D. Statistics,** GPA: 3.91Expected: 12/ 2027

Montana State University, Bozeman, MT

**M.S. Statistics**, GPA: 3.89 05/2024

Montana State University, Bozeman, MT

**B.S. Actuarial Science**, GPA: 3.89 09/ 2021

Kwame Nkrumah University of Science and Technology,Kumasi, Ghana

# PROFESSIONAL EXPERIENCE

**Institute for Mathematical and Statistical Innovation (IMSI), Chicago, Illinois**

Data Science Bootcamp Participant 06/2025

## Montana State University, Bozeman, Montana

Graduate Researcher 08/2024 - present

Graduate Research Assistant 12/2023 – 05/2024

Statistical Consultant 1/2024 – 05/2024

**Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana**

Research Assistant 08/2021 – 07/2022

## KPMG, Australia (Virtual)

Data Analytics Intern 7/2020 – 8/2020

# TEACHING

## Montana State University, Bozeman (MSU), MT

## Graduate Teaching Assistant 08/2022 - present Course Assistant

Spring 2025 – STAT 337 (Intermediate Statistics with Computing)

Fall 2024 – STAT 337 (Intermediate Statistics with Computing)

Fall 2023 – STAT 337 (Intermediate Statistics with Computing)

Spring 2023 – STAT 216 (Introduction to Statistics)

Fall 2022 – STAT 216 (Introduction to Statistics)

## Instructor

Summer 2025 – STAT 216 (Introduction to Statistics)

Summer 2024 – STAT 216 (Introduction to Statistics)

**Tutor**

Fall 2022 – Math and Stat learning center (MSC)

## Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana

## Undergraduate Teaching Assistant 10/2021 – 07/2022

Spring 2022 – STAT 371 (Regression Analysis) Fall 2021 – STAT 153 (Statistical Methods I)

# AWARDS AND SCHOLARSHIPS

Summer Travel Award, Department of Mathematical Sciences, MSU 02/2025

Full PhD assistantship award, Department of Mathematical Sciences, MSU 08/2024

Master of Science in Statistics, Montana State University 05/2024

Fee waiver scholarship, Department of Mathematical Sciences, MSU 02/2024

Full MS assistantship award, Department of Mathematical Sciences, MSU 08/2022

Academic excellence scholarship recipient, Ghana Scholarship Secretariat 05/2021

# VOLUNTEERING & LEADERSHIP

Volunteer, Human Resource Development Council (HRDC), Bozeman, MT 02/2025 - present

Student mentor, Actuarial Science Student Association, KNUST chapter 09/2019 – 05/2021

Judicial Committee Chair, Actuarial Science Student Association, KNUST chapter 09/2020 – 08/2021

Deputy Finance Chair, Actuarial Science Student Association of Ghana 09/2019 – 05/2020

# PUBLICATIONS

## Accepted and published

Chondrocytes Embedded in Agarose Generate Distinct Metabolic Heat Profiles Based on Media Carbon Sources. *Annals of Biomedical Engineering, 1-9* (2025)*.*

* Determined if three-dimensionally encapsulated chondrocytes are capable of heat production toward improving knowledge of chondrocytes central metabolism.

Modeling of the Daily Dynamics in Bike Rental System Using Weather and Calendar Conditions: A Semi-Parametric Approach. *Scientific African* (2024): e02211.

* 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. *Appl. Math* 17, no. 2 (2023): 261-271.

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

## In preparation

Metabolic Heat Profiles in Chondrocytes: A Comparison of Functional and Integrated Data Approaches.

• Compared a functional approach that analyses heat curves over time to an integrated approach that aggregates instantaneous heat measurements over time.

# CERTIFICATIONS

Biomedical Responsible Conduct of Research Course, CITI Program 01/2024

IRB Social and Behavioral Research, CITI Program 01/2024

Git, Simplilearn 11/2023

Data Visualization in R with ggplot2, LinkedIn 11/2021

The Data Scientist’s Toolbox, Coursera 03/2021

SQL for Data Science, Coursera 12/2020

Excel/VBA for Creative Problem Solving, Part 1, Coursera 11/2020

Python Data Structures, Coursera 11/2020

Programming for Everybody, Getting Started with Python, Coursera 10/2020

# TECHNICAL SKILLS

**Programming Languages**: R (Markdown, Quarto, Stan, JAGS, Shiny), Python (Pandas, NumPy), SAS

**Database**: SQL

**Project Management Tool**: Git/GitHub

**Statistical Methods**: Functional data analysis, Bayesian data analysis, regression modeling, spatial data analysis, experimental design

# PROFESSIONAL AFFILIATIONS & HONOR SOCIETY

## American Statistical Association

Member 03/2024

Participant, JSM Diversity Mentoring Program 08/2024

**Royal Statistical Society**

Student member 01/2024

## The Honor Society of Phi Kappa Phi

Member, Montana State University 01/2024