Maame Ama Bainson

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Education

The Maxwell Institute for Mathematical Sciences (in collaboration with The University of Edinburgh and Heriot-Watt University) — *Edinburgh, UK*

PhD. Mathematical Modelling, Analysis and Computation — *October, 2023 - Present*

African Institute of Mathematical Sciences (AIMS - Ghana) — *Accra, Ghana*

Master of Science (MSc.), Mathematical Sciences — *November 2022 – August 2023*

- **Grade:** Distinction, A$^+$
- **Courses:** Markov processes, Random Systems, Mathematical Biology, Mathematical Problem Solving, Stochastic Analysis, Functional Analysis, Differential Equations, Linear Algebra, Programming (Python)

University of Ghana (UG) — *Accra, Ghana*

Bachelor of Science (BSc.), Actuarial Science — *August 2017 – November 2021*

- **FGPA:** 3.77/4.00
- **Courses:** Stochastic Processes, Actuarial and Financial Mathematics, Statistics, Economics, Calculus, Linear and Abstract Algebra, Programming (R, C++)

Teaching Experience

Heriot Watt University — *Edinburgh, United Kingdom*

Tutor — *January 2025 – Present*

- Handled classes of 20+ students mainly in Statistics and Mathematical Biology
- Co-organized tutorials and lab sessions to help them test their understanding through pre-set exercises.

Industry Immersion Africa — *Accra, Ghana*

Tutor — *September 2023 –October 2023*

- Handled a class of 20 recent graduates during the Industry Immersion Program that sought to train them in industry-applicable skills.
- Organized tutorials and discussion sessions to aid them in understanding the program material.

Department of Statistics and Actuarial Science, University of Ghana — *Accra, Ghana*

Teaching Assistant — *October 2021 – September 2022*

- Organized tutorial sessions for an average number of 200 students per semester to strengthen their understanding of relevant concepts.
- Graded work submissions and produced solutions to assignments and quizzes.
- Assisted the supervising lecturer with course presentations during lecture hours.
- Provided constructive feedback on students' performance to maximize their potential and encourage progress.

Research Experience

Eradication Policies for Endemic Diseases

PhD Year 1 - Extended Project — *April 2024 – Present*

- Employs the Wentzel–Kramers–Brillouin (WKB) approximation which transforms the stochastic system representing the disease of interest to a Hamiltonian system to obtain an estimate for the mean persistence time of the endemic disease.

Enhancing Markov Chain Forecasting in Mixed Martial Arts (MMA)

PhD Year 1 - Semester 2 Industrial Project — *March 2024*

- Aimed to enhance the current Markov chain model which uses previous full fight data to forecast an athlete's performance during an MMA bout.
- Developed a model extension that considered round-by-round data and introduced a stamina/fatigue coefficient to reflect how the full fight result is dependent on the round performance.

Stochastic Optimal Control with Filtering

PhD Year 1 - Semester 1 Taster Project — *December 2023*

- Used stochastic filtering theory to solve the optimal control problem of maximizing the return on investment with only partial observations that is, access to only the price and volatility of the financial asset.

Forward-Backward Stochastic Differential Equations with Jumps

Master's Thesis - AIMS Ghana — *July 2023*

- Reviewed the paper 'Forward-backward stochastic differential equations (FBSDEs) with jumps and classical solutions to nonlocal quasilinear parabolic PDEs ' by E. Shamarova. and R.S Pereira.
- Reproduced their results on obtaining an existence and uniqueness theorem for solutions to fully coupled FBSDEs with jumps.

A Statistical Analysis of the Impact of COVID-19 on the Ghanaian Life Insurance Industry

Undergraduate Final Year Thesis - University of Ghana   *September 2021*

- Conducted a comprehensive statistical study on data from Ghanaian life insurance companies, utilizing methods such as ARIMA to determine the impact of COVID-19 on the sector.
- Provided practical recommendations based on findings to help the industry enforce the necessary measures in preparation for similar future events.

Other Experience

Maths Outreach Team, University of Edinburgh - School of Mathematics

Volunteer   *November 2023 – Present*

- Engaging the general public each semester with a series of activities that seek to present Mathematics in a fun and relatable way.

Circles for Leadership and Educational Development

Research Volunteer   *January 2022 – January 2023*

- Periodically created research-focused articles and content that highlighted the current state of education in Africa and suggested possible solutions to issues that hindered its progress.

Hypacart Ltd.

Marketing Intern   *June 2018 - July 2018*

- Co-developed a practical marketing roadmap that significantly increased the company's visibility and productivity.

Access Bank Ltd.

Retail Banking Intern   *June 2018 - July 2018*

- Attended to customers concerning all operations on their savings and current accounts.

Skills

Programming	MATLAB, Python (Pandas, NumPy, Scikit-learn. etc.).
Miscellaneous	LaTeX(Overleaf/R Markdown), Microsoft Office.
Soft Skills	Time Management, Teamwork, Problem-solving, Communication Skills.

Achievements

2023	**MAC-MIGS Doctoral Studentship**, The Maxwell Institute for Mathematical Sciences	*Edinburgh, UK*
2023	**Emmy Noether Award for Best Graduating Female Student**, African Institute for Mathematical Sciences	*Accra, Ghana*
2023	**F.K.A Allotey Memorial Award** , African Institute for Mathematical Sciences	*Accra, Ghana*
2022	**Master's in Mathematical Sciences Scholarship**, African Institute for Mathematical Sciences	*Accra, Ghana*
2021	**Dean's Honor List (2019/2020 Academic Year)**, College of Basic and Applied Sciences, University of Ghana	*Accra, Ghana*

References available upon request.