

CURRICULUM VITAE

ALEXANDER BOATENG, PhD

CONTACT INFORMATION

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PROFILE AND RESEARCH INTERESTS

Alexander is a Statistician and an Assistant Professor of Statistics in the Department of Mathematics and Computer Science, Modern College of Business and Science. His research focuses mainly on applying statistics to solve practical problems in a multidisciplinary environment. Alexander's research interests include statistical modelling, statistical learning, stochastic modelling and multivariate analysis, in analysing environmental and health-related issues. Alexander has collaborated with several colleagues in matters of research and supervision. He is an external examiner for North-West and Sol-Plaatje Universities in South Africa. Alexander has also assessed several honours and master's and doctoral theses from North-West University, University of Johannesburg and the University of KwaZulu-Natal in South Africa and Kwame Nkrumah University of Science and Technology, Ghana and has also supervised several graduate and postgraduate students. He is also a member of International Statistical Institute (ISI), South African Statistical Association (SASA), and International Biometric Society (IBS).

EDUCATIONAL BACKGROUND

Degree	Date	Institution
PhD Statistics	12 th April 2017	University of Limpopo, South Africa
MPhil Applied Mathematics (Statistics Option)	1 st June 2012	Kwame Nkrumah University of Science and Technology, Ghana
BEd Mathematics	23 rd May 2008	University of Cape Coast, Ghana

RELATED SKILLS

- Proficient in Statistical Software (R, Python, SPSS)
- Proficient in Microsoft Office (Word, Excel, Access, and PowerPoint)
- Proficient in Latex

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS

- International Statistical Institute (ISI)
- International Biometric Society (IBS)
- South African Statistical Association (SASA)

WORK EXPERIENCE

2024 – Present	Assistant Professor , Modern College of Business and Science, Muscat, Sultanate of Oman
2022-2023	Senior Lecturer , Department of Biostatistics, University of the Free State, Bloemfontein, South Africa
2020-2022	Lecturer , Department of Statistics and Actuarial Science, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana
2018-2020	Lecturer , Department of Statistics, University of Cape Coast (UCC), Cape Coast, Ghana.
2018-2020	Part-Time Lecturer , Department of Statistics and Actuarial Science, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana.
2017-2018	Lecturer , Department of Statistics and Operations Research, University of Limpopo, Sovenga, South Africa.
2015-2016	Faculty Researcher , Faculty of Science and Agriculture, University of Limpopo, Sovenga, South Africa.
2013-2014	Teacher , Physical Science and Mathematics, Lekota Secondary School, South Africa.
2008-2013	Teacher , Mathematics, Christ the King Senior High School, Obuasi, Ghana.

SERVICE TO THE UNIVERSITY COMMUNITY

May 2024	Resource Person, Exploratory Data Analysis Workshop 0 Parametric and Nonparametric Statistics with SPSS, Department of Mathematics and Computer Science, MCBS, Muscat, Sultanate of Oman.
Mach 2024	Member, Curriculum Review for Statistics under Department of Mathematics and Computer Science, MCBS, Muscat, Sultanate of Oman.
April 2024	Member, Sustainability Committee, MCBS, Muscat, Sultanate of Oman.
Sept 2022	Moderator for Mathematics and Related Courses for Catholic Institute of Technology, Accra.
April 2022	Resource Person: Data Management in SPSS; Non-Parametric Tests and Regression Analysis, A 4-Day KNUST-LISA TEACH Project in Collaboration with TRECK, KNUST.
Jan 2022	Member, Curriculum Development Committee for Mathematical Statistics for PhD and MPhil Programs, Department of Statistics and Actuarial Science, KNUST.
Feb 2022	Resource Person: Introduction to R; Exploratory Data Analysis with R and Time Series Analysis with R, A 3-Day KNUST-LISA TEACH Project in Collaboration with TRECK, KNUST.
Feb 2022	Patron, Ghana Statistical Association, KNUST Branch.
Jan 2022	Examinations Officer (Statistics), Department of Statistics and Actuarial Science, KNUST.
Jan 2022	Service Lecturer for Number Theory and Data Analysis for Educational Research, Department of Teacher Education, KNUST.
Jul 2021	Member, Committee for Course Allocation, Department of Statistics and Actuarial Science, KNUST.
Mar 2021	Member, Accreditation Committee, Department of Statistics and Actuarial Science, KNUST.
Mar 2021	Member, Postgraduate Admission Committee, Department of Statistics and Actuarial Science, KNUST.
Apr 2021	Member and Secretary for Curriculum Development, Review of the BSc Statistics Top-Up Curriculum, Department of Statistics and

	Actuarial Science, KNUST.
Apr 2021	Member , Curriculum Development Committee for Diploma in Statistics to be run under the Institute of Distance Learning (IDL), Department of Statistics and Actuarial Science, KNUST.
Aug 2021	Chief Examiner , Further Algebra, Department of Teacher Education, KNUST.
Nov 2021	Service Lecturer , Sandwich Program teaching Probability and Statistical Inference, Department of Teacher Education, KNUST.
Nov 2021	Panel Member and Examiner: Examination of PhD research proposals, Department of Teacher Education and Department of Statistics and Actuarial Science, KNUST.
May 2020	Panel Member , Department Statistics and Actuarial Science of BSc Statistics project defence.
Jan 2020	Panel Member for Lectureship Appointment Interview, Department of Statistics and Actuarial Science, KNUST.
Feb 2020	Focal Person for COVID-19 in the Facilities and Departments, Department of Statistics and Actuarial Science, KNUST.
Mar 2019	Member , Team for student's field trip supervision, Department of Mathematics, KNUST.

SERVICE TO THE NATIONAL COMMUNITY

May 2021	Participant , Discrete Choice Modelling, Capacity Building Workshop organised by KNUST-LISA.
Sep 2020	Member , Local Organising Committee for World Statistics Day Symposium, organised by KNUST-LISA in collaboration with International Statistical Institute (ISI).
Nov 2019	Panel Member and Presenter , Faculty of Applied Science and Technology's Maiden Colloquium, Kumasi Technical University
Jun 2010	Coordinator and Facilitator for 2010 Census for Obuasi Municipality, Ghana.

SERVICE TO THE INTERNATIONAL COMMUNITY

May 2024	Moderator for Undergraduate Examination (Regression analysis, GLMs, Nonparametric Statistics) for Sol Plaatje University, South Africa.
Jun 2020	Moderator for Undergraduate, University of Johannesburg, South

Jun 2020	Africa. Moderation of Examination , North-West University, South Africa.
Nov 2018	External Examiner , Department of Statistics, North-West University, South Africa.
Dec 2018	External Assessor for Postgraduate Thesis, University of Kwa- Zulu Natal, South Africa.
Dec 2018	Moderator for Undergraduate Examinations, North-West University, South Africa.
Dec 2018	External Assessor for Postgraduate Thesis, University of Johannesburg, South Africa.

CONTINUING PROFESSIONAL DEVELOPMENT (WORKSHOP ATTENDED)

- Introduction to STATA, Discrete Choice Modelling and Structural Equation Modelling. A 3-day workshop organised by KNUST-LISA in collaboration with International Statistical Institute (ISI), 10-12 May 2021.
- Application of numerical methods in statistics with R. A 2-day workshop organised by KNUST-LISA in collaboration with the International Statistical Institute (ISI), 21-22 October 2020.
- Improving the quality of higher education through effective measurement and evaluation. A 4-day workshop organised by the Quality Assurance and Planning Unit, KNUST, 20-24 August 2018.
- Training in journal credibility and staff visibility for academic staff. A 2-day workshop organised by the College of Science Library Digital Hub, KNUST, 14-15 July 2021

AWARDS AND RECOGNITION

- Elsevier Reviewer Recognition Awards (2018)
- DST-NRF, CoE-MaSS Doctoral bursary for PhD Students, South Africa (2014 - 2016)
- An Award from the Risk and Vulnerability Centre (RAVC/VLIR), University of Limpopo, South Africa (2016)
- An award for Overall Best Presenter for PhD Category, Annual Research Day, Faculty of Science and Agriculture, University of Limpopo, South Africa (2016)
- An award for Best Presenter at CoE-MaSS Symposium for PhD Category, University of Limpopo, South Africa (2015)
- Best Teacher Award (Mathematics) for Obuasi Municipality, Ghana (2012)

TEACHING INTERESTS

- Statistical Learning
- Stochastic Processes
- Probability and Statistics
- Integral and Differential Calculus
- Time Series Analysis
- Regression Analysis
- Statistical Inference
- Theory of Distributions
- Generalised Linear Models
- Probability and Measure Theory
- Design of Experiments
- Multivariate Analysis
- Categorical Data Analysis
- Biostatistics

RESEARCH AREA AND INTERESTS

- Long Range Dependence
- Stochastic Modelling
- Statistical Learning
- Statistical Modelling and Simulation
- Time Series Modelling and Forecasting
- Data Analytics
- Multivariate Analysis

ONGOING RESEARCH (UNDER REVIEW)

- [1] Climate-informed malaria prediction models: A Bayesian approach for South African endemic provinces (2024 Under Review)
- [2] Beyond GDP: Unraveling the nexus of economic advancement, employment stability, and forest conservation in Sub-Saharan Africa (2023 Under Review)
- [3] Parameter estimation of Ornstein-Uhlenbeck process using resampling estimation techniques - A simulation study (2023 Under Review)

- [4] Optimizing Binary Classification Performance in Neural Networks through Simulation: A Comparative Study of Activation Functions (2023 Under Review)

REFEREED JOURNAL PUBLICATIONS

- [1] Odoom, C., **Boateng, A.**, Mensah, S. F., & Maposa, D. (2024). Modelling of the Daily Dynamics in Bike Rental System Using Weather and Calendar Conditions: A Semi-Parametric Approach. *Scientific African*, e02211.
- [2] Ampadu, S., Mensah, E. T., Aidoo, E. N., **Boateng, A.**, & Maposa, D. (2023). A comparative study of error distributions in the GARCH model through a Monte Carlo simulation approach. *Scientific African*, e01988.
- [3] Benjamin Darko Asamoah, Matt Dodd, Lily Lisa Yevugah, Lawrence Sheringham Borquaye, **Alexander Boateng**, Marian Asantewah Nkansah & Godfred Darko (2023). Distribution and in-vitro bioaccessibility of potentially toxic metals in surface soils from mining and non-mining community in Ghana: Implications for human health. *Environmental Geochemistry and Health. Springer Nature*.
- [4] **Boateng, A.**, Maposa, D., & Mokobane, R. (2023). Retrospective Post-Hospitalisation COVID-19 Mortality Risk Assessment of Patients in South Africa. *European Journal of Investigation in Health, Psychology and Education*, 13(9), 1655-1675.
- [5] **Boateng, A.**, Maposa, D., Mokobane, R., Darikwa, T., & Gyamfi, C. (2023). Analysis of COVID-19 cases and comorbidities using machine learning algorithms: A case study of the Limpopo Province, South Africa. *Scientific African*, 21, e01840.
- [6] Sehlabana, Makwelantle Maposa, Daniel and **Boateng, Alexander** (2023). Modelling the Misuse of Alcohol and Drugs in South Africa Using Bayesian Binary Logistic Regression, *Journal of Statistics Applications & Probability*: Vol. 12: Iss. 2, Article 34.
- [7] Von Tamakloe, B., **Boateng, A.**, Mensah, E. T., & Maposa, D. (2023). Impact of Risk Management on the Performance of Commercial Banks in Ghana: A Panel Regression Approach. *Journal of Risk and Financial Management*, 16(7), 322.
- [8] Mensah, E. T., **Boateng, A.**, Frempong, N. K., & Maposa, D. (2023). Simulating Stock Prices Using Geometric Brownian Motion Model Under Normal and Convuluted Distributional Assumptions. *Scientific African*, e01556.
- [9] **Alexander Boateng**, Christopher Odoom, Eric Teye Mensah, Sarah Mensah Fobi, Daniel Maposa, (2023). Predictive Analysis of Misuse of Alcohol and Drugs using Machine Learning Algorithms: The Case of using an Imbalanced Dataset from South Africa, *Applied Mathematics & Information Sciences*, Volume 17, No. 2, PP:261-271.

- [10] Eric N. Aidoo, Simon K. Appiah, Gaston E. Awashie, and **Alexander Boateng** (2021). Geographically weighted principal component analysis for characterising the spatial heterogeneity and connectivity of soil heavy metals in Kumasi, Ghana, *Heliyon* 1-14.
- [11] Aidoo, E.N., Appiah, S.K. and **Boateng, A.** (2021). A Monte Carlo simulation study of small sample bias in ordered logit model under multicollinearity, *Journal of Experimental Education*, 1-9.
- [12] **Boateng, A.**, Claudio-Quiroga, G. and Gil-Alana, L.A. (2020). Exchange rate dynamics in South Africa, *Applied Economics* 1-14.
- [13] Makweantle Asnath Sehlabana, M. A., Maposa, D. and **Boateng, A.** (2020). Modelling Malaria Incidence in the Limpopo Province, South Africa: Comparison of Classical and Bayesian Methods of Estimation, *Int. J. Environ. Res. Public Health*, 17(14), 5016.
- [14] Chris Nembidzane, Maseka Lesaoana, Kotsedi Daniel Monyeki, **Alexander Boateng**, and Phuti, J. Makgae (2020). Using the SITAR Method to Estimate Age at Peak Height Velocity of Children in Rural South Africa: *Ellisras Longitudinal Study*, 7(3), 17.
- [15] **Boateng, A.**, Lesaoana, M., Siweya, H. J., Belete, A. and Gil-Alana, L. A. (2018). Non-Linearities, Structural Breaks and Fractional Integration in the Analysis of Ghana and South African CPI inflation Rates, *The Journal of Developing Areas*, 52(1): 161-172.
- [16] **Boateng, A.**, Lesaoana, M., Siweya, H. J. and Belete, A. (2017). Modelling persistence in the conditional mean of inflation using the ARFIMA process with GARCH and GJR-GARCH innovations: The case of Ghana and South Africa, *African Review of Economics and Finance*, 9(2): 96-130.
- [17] **Boateng, A.**, Gil-Alana, L. A., 'Maseka, L., Siweya, H., and Belete, A. (2016). Long memory and ARFIMA modelling: The case of CPI inflation rate in Ghana, *The Journal of Developing Areas* 50(3), 287-304.

CONFERENCE PAPERS

- [1] **Boateng, A** (2023). Investigating the effect of activation functions and sample sizes on the performance of artificial neural network models through simulation. *South African National Research Data Workshop 2023 organized by Data Intensive Research Initiative of South Africa (DIRISA), in Pretoria, South Africa, 5-6 July 2023.*
- [2] **Boateng, A.**, Lesaoana, M., Siweya, H. J. and Belete, A. (2017). Modelling persistence in the conditional mean of inflation using the ARFIMA process with GARCH and GJR-GARCH innovations: The case of Ghana and South Africa. *10TH International Conference of the ERCIMWG on Computational and Methodological Statistics, 16 - 18 December 2017, Senate House/Birkbeck, University of London, UK.*

- [3] **Boateng, A.**, Appiah, S.K., and D. Maposa (2021). An integer-valued modelling and forecast of COVID-19 cases in Ghana: A review and comparative study, *Transylvanian Review* 29(3):15712- 15721. *World Statistics Day and International Year of Women in Statistics and Data Science Symposium at KNUST, Kumasi, Ghana, 20-22 October 2020.*

PRESENTATION AND INVITED TALKS (SEMINAR)

- [1] Integer-valued modelling of COVID-19 cases: A data-driven approach at the World Statistics Day and International year of women in statistics and data science symposium, at KNUST, Ghana (October 2020)
- [2] Exchange rate dynamics in South Africa Research Colloquium 2019: Applied Sciences Research in Technical Universities: Experiencing the New Paradigm at Kumasi Technical University, Kumasi, Ghana (November 2019)
- [3] Research ethics and new forms of data for social and economic research, OECD Workshop Discussion, CSIR Convention Centre, Pretoria, South Africa. (November 2016)
- [4] Modelling persistence in the conditional mean of inflation using the ARFIMA process with GARCH and GJR-GARCH innovations: The case of Ghana and South Africa. Review of Economics and Finance Conference, KNUST, Ghana. (August 2016)
- [5] DST-funded event to interact and collaborate with international experts. World Social Science Forum, September 2015, International Conference Centre (I.C.C.), Durban, South Africa (September 2015)
- [6] Long Memory and ARFIMA Modelling: The case of CPI Inflation rates of Ghana. South African Statistical Association (SASA 2015) Conference, University of Pretoria, South Africa. (Nov/Dec 2015)
- [7] Is sitting too much increase the risk of Diabetes? South African Statistical Association (SASA 2014) Conference, Rhodes University, Grahamstown, South Africa. (Nov/Dec 2014)
- [8] Modelling the occurrence and Incidence of Malaria: A case study at Obuasi Government Hospital. South African Statistical Association (SASA 2013) Conference, University of Limpopo, Sovenga, South Africa. (Nov/Dec 2013)

JOURNAL MANUSCRIPT REVIEWED

- Statistical Mechanics and Its Application
- Journal of International Development
- African Development Review
- The Journal of Developing Areas
- South African Journal of Science
- Scientific African
- Journal of Forecasting

COMPLETED POSTGRADUATE SUPERVISION

- **MPhil Mathematical Statistics:** A comparative assessment of estimation methods for Ornstein Uhlenbeck models (Maxwell Asare Barima, 2023, Ghana).
- **MSc Applied Statistics:** Statistical modelling of injury mortality in Gauteng and Mpumalanga provinces of South Africa (Johannes Lebogo, 2023, South Africa).
- **MPhil Mathematical Statistics:** Modification of Brownian motion in simulating stock prices: A Monte Carlo Simulation Approach (Eric Teye Mensah, 2023, Ghana).
- **MPhil Mathematical Statistics:** Comparison of error distributions in the GARCH model: A Monte Carlo simulation approach (Samuel Ampadu, 2023, Ghana)
- **MPhil Actuarial Science:** Application of Bootstrap Methods in Risk theory (Paul Abgekoenu, 2023, Ghana)
- **MSc Applied Statistics:** Financial risk management, supervision, and performance of commercial banks in Ghana (Bismark Von K. Tamakloe, 2022, Ghana)
- **MSc Applied Statistics:** Empirical analysis on savings and investment behaviour of people in the Ga East District (Godwin Quansah, 2022, Ghana)
- **MSc Applied Statistics:** The impact of covid-19 on depository shares: Evidence from Ghana stock exchange (Joseph Tei, 2022, Ghana)
- **MPhil Statistics:** Multivariate time series modelling of ex-pump prices of petroleum products in Ghana (Theophilus Asamoah, 2021, Ghana).
- **MSc Statistics:** Modelling malaria incidence in the Limpopo Province of South Africa: Comparison of Classical and Bayesian Methods of Estimation (Sehlabana, M. Asnath, 2020, South Africa).

- **MSc Statistics:** Modelling the sporadic behaviour of rainfall in the Limpopo Province, South Africa: An application of ETS State Space and SARIMA models (Molautsi Victoria, 2020, South Africa).
- **MSc Statistics:** Analysis of malaria incidence in the Limpopo Province using Poisson and Negative Binomial regression models (Ramalata Aluwani, 2019, South Africa).

ONGOING POSTGRADUATE SUPERVISION

- **PhD Statistics:** Bayesian modelling of malaria cases in South Africa through the elicitation of a prior distribution: Comparison of objective and subjective prior distributions.
- **MPhil Mathematical Statistics:** Comparative analysis of supervised machine learning algorithms to predict the status of Diabetes.

COMPLETED UNDERGRADUATE SUPERVISION

- 50 Groups

INTERNAL AND EXTERNAL EXAMINER FOR POSTGRADUATE THESIS

- **PhD Mathematics Education:** Integration of Ethnomathematical perspectives into Geometry teaching in Colleges of Education in Ghana (KNUST, Ghana -*Internal*)
- **PhD Statistics:** Machine learning robustness in dealing with outliers and missing data (North West University, South Africa, 2024 - *External*)
- **PhD Statistics:** Count series models and machine learning regression for forecasting South African labour market indicator (North West University, South Africa - *External*)
- **PhD Statistics:** Optimal price of health insurance schemes in a heterogeneous and changing population (National University of Science and Technology NUST, Zimbabwe, 2023 - *External*)
- **PhD Statistics:** A Panel Data Multilevel Stochastic Frontier Model: (With Application) (Chinhoyi University of Technology, Zimbabwe, 2023- *External*)

- **PhD Statistics:** Bayesian generalised mixed modelling of cancer data in Nigeria (University of KwaZulu Natal, South Africa, 2018 - *External*)
- **PhD Statistics:** The performance of conditional heteroskedastic VAR enhanced multivariate GARCH models on time-varying integrated data (North West University, South Africa, 2019- *External*)
- **MCom Economics:** Risk-return nexus in a GARCH-M framework: Empirical evidence from South Africa stock market (University of Johannesburg, 2019, South Africa- *External*)
- **MPhil Mathematical Statistics:** Optimal design of stochastic hybrid energy supply system using sample average approximation (Kwame Nkrumah University of Science and Technology, Ghana, 2019 - *Internal*).
- **MSc Applied Statistics:** Analysis of risk factors associated with severe injury in child pedestrian-vehicle collision in Ghana (Kwame Nkrumah University of Science and Technology, Ghana, 2018 - *Internal*)
- **MPhil Applied Statistics:** Modeling economic growth using vector error correction model: Empirical evidence from Ghana, (Kwame Nkrumah University of Science and Technology, Ghana, 2021 - *Internal*)
- **MPhil Applied Statistics:** Extended vector autoregressive model of yam production in Northern region of Ghana (Kwame Nkrumah University of Science and Technology, Ghana, 2021 - *Internal*).
- **MPhil Applied Statistics:** Modeling Erb's palsy using logistic regression: a case study in the ho municipality (Kwame Nkrumah University of Science and Technology, Ghana, 2021 - *Internal*).
- **MPhil Applied Statistics:** Modelling the determinants of poor performance of senior high students in core and elective mathematics examinations, (Kwame Nkrumah University of Science and Technology, Ghana, 2021 - *Internal*)
- **MPhil Applied Statistics:** An autoregressive vector analysis of five major economic indicators in Ghana: assessment of short-run and long-run dynamic relationships, KNUST (Kwame Nkrumah University of Science and Technology, Ghana, 2021 - *Internal*)
- **MPhil Applied Statistics:** Multivariate analysis of variance of induction of labour on the odds of caesarean delivery, (Kwame Nkrumah University of Science and Technology, Ghana, 2021 - *Internal*)

REFERENCES

- Prof LA Gil-Alana, Department of Economics, University of Navara, Spain, (alana@unav.es)
- Prof Yehenew G. Kifle, Department of Mathematics, University of Maryland, Baltimore County (UMBC) (yehenew@umbc.edu)
- Prof Daniel Maposa, Department of Statistics and Operations Research, University of Limpopo, South Africa (danmaposa@gmail.com / daniel.maposa@ul.ac.za)
- Dr Eric Nimako Aidoo, Department of Computer Science, Heriot-Watt University, Dubai Campus, (en.aidoo@yahoo.com / e.aidoo@hw.ac.uk)
- Prof Atinuke O Adebajji, Department of Statistics and Actuarial Science, Kwame Nkrumah University of Science and Technology, Ghana (tinuadebanji@gmail.com / aodebanji.cos@knust.edu.gh)