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Department of Statistics and Actuarial Science
Kwame Nkrumah University of Science and Technology (KNUST)
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Associate Professor

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PERSONAL INFORMATION

Date of Birth June 5, 1972
Place of Birth Accra, Ghana
Nationality Ghanaian
Marital Status Married

EDUCATION

October 2007–June 2011 **PhD Applied Mathematical Statistics**, *RPTU Kaiserslautern-Landau (formerly known as University of Kaiserslautern)*, Germany
October 2001–November 2003 **MSc Financial Mathematics**, *RPTU Kaiserslautern-Landau (formerly known as University of Kaiserslautern)*, Germany
January 1995–August 1999 **BSc Mathematics**, *University of Cape Coast*, Ghana
September 1990–June 1992 **G.C.E. A'Level**, *Bishop Herman College*, Kpando, Ghana
Subjects: Mathematics, Physics, Chemistry, General Paper.
September 1985–June 1990 **G.C.E./S.C. O'Level**, *Bishop Herman College*, Kpando, Ghana
Subjects: English Language, Modern Mathematics, Additional Modern Mathematics, Physics, Chemistry, Biology, Economics, Geography.
September 1979–August 1985 **Common Entrance Examinations**, *Harrow International Preparatory School*, Abeka, Accra, Ghana

AREAS OF SPECIALIZATION

Mathematical Statistics, Financial Statistics, Financial Mathematics and Actuarial Science

AREAS OF RESEARCH INTEREST

Statistical Modelling, Financial Modelling, Design and Analysis of Experiments

SELECTED PUBLICATIONS

Overcoming Technical and Operational Barriers in Low-Voltage Mini-Grids: Two Decades of Research Trends, Progress, and Pathways for Accelerated Rural Electrification (2005–2025), *Energies*, 19(4), 933. Mahu, S.A., Odoi-Yorke, F., Adu-Poku, A., Avuglah, R.K., Frimpong, E.A., Quansah, D.A., Kemausuor, F. (2026).

Predicting Malaria Outbreaks in Children Under Five: Insights from Ghana, *Journal of Health Informatics in Africa*, 12(1). Boateng, M.A., Agyapong, E.K., Treasure, T.K., Avuglah, R.K. and Nigre, J.S. (2025).

Optimizing Renewable Energy Integration: Advanced Statistical Modelling Techniques for Enhanced Grid Stability and Economic Viability. *Academia Green Energy*, 2(2). Owusu-Ansah, E.D.G.J., Avuglah, R.K., Harris, E., Kyere, A.Y., Amankwaah, B.D. (2025).

Machine Learning Algorithms Analysis of Synthetic Minority Oversampling Technique (SMOTE): Application to Credit Default Prediction. *Ratio Mathematica*, 53. Owusu-Ansah, E.D.G.J., Doamekpor, R., Avuglah, R.K., Adwubi, Y.K. (2024).

Geographically weighted logistic regression model for identifying risk factors for malaria infection among under-5 children in Ghana. *Scientific African*, 26, e02398. Appiah, E.K., Aidoo, E.N., Avuglah, R.K., and Appiah, S.K. (2024).

Quantum Leap and Uptake for Technological Advances in Africa in the Era of the COVID-19 Crisis. *Examining the Rapid Advance of Digital Technology in Africa*, 238-269. Owusu-Ansah, E.D.G.J., Avuglah, R.K., and Kyere, Y.A. (2024).

Simulation Study of Estimators of the Gamma Rate Parameter Using MLE as a Baseline Estimator. *Journal of the Indian Society for Probability and Statistics*, 25(1), 307-325. Frempong, N.K., and Avuglah, R.K. (2024).

Determinants of Length of Stay of Snakebite Victims in a Hospital. *Statistical Modeling Approach. European Journal of Theoretical and Applied Sciences*, 1(5), 1445-1453. Frempong, N.K., Avuglah, R.K., Anane, J.A., and Atambire, J. (2023).

A mixture of Clayton, Gumbel, and Frank copulas: A complete dependence model. *Journal of Probability and Statistics*, 2022(1), 1422394. Boateng, M.A., Omari-Sasu, A.Y., Avuglah, R.K., and Frempong, N.K. (2022).

Improved estimators for the rate parameter of gamma model using asymptotic properties, *Heliyon* 7(5), e0694. Frempong, N.K., Avuglah, R.K., Dontwi, I.K., Bukari, F.K. (2021).

Application of joint generalized linear models in determining physical support factors that influence crop yield in Northern Ghana, *Universal Journal of Agricultural Research*, 8(4), 124-130. Sarpong, S.A., Avuglah, R.K., Nsawah-Nuamah, N.N.N. (2020).

On a hybrid Clayton-Gumbel and Gumbel-Frank bivariate copulas with application to stock indices, *Journal of Advances in Mathematics and Computer Science*, 1-13. Boateng, M.A., Omari-Sasu, A.Y., Frempong, N.K., Avuglah, R.K. (2019).

Hybrid Clayton-Frank convolution-based bivariate Archimedean copula, *Journal of Probability and Statistics*. Boateng, M.A., Omari-Sasu, A.Y., Avuglah, R.K., Frempong, N.K. (2018).

On two random variables and Archimedean copulas, *International Journal of Statistics and Applications*. Boateng, M.A., Omari-Sasu, A.Y., Avuglah, R.K., Frempong, N.K. (2017).

Macro and Micro Determinants of Credit Risks and its Effect on Profitability, International Journal of Emerging Technology and Advanced Engineering Vol.7(2): pgs. 103-107. Abanga M.N.A., and Avuglah, R.K. (2017).

Performance Assessment of Penalized Variable Selection Methods Using Crop Yield Data from the Three Northern Regions of Ghana, International Journal of Probability and Statistics 5(1):pgs. 10-17., Sarpong S.A., Nsowah-Nuamah N.N.N., Avuglah R.K., Oh S., Lee Y. (2016).

Impact of trade policies on wood products export in Ghana, American Journal of Mathematics and Statistics Vol.5(5): pgs. 221-229. Acquah, B.S., Avuglah, R.K., and Harris, E. (2015).

Analysis of Crop Yield Physical Support Services Data Using Hierarchical Generalized Linear Models, International Journal of Statistics and Applications Vol.5(5): pgs. 196 - 207. Sarpong, A.S., Oh, S., Avuglah, R.K., Nsowah-Nuamah, N.N.N., Lee, Y. (2015).

Analysing the Major Effects of Exports and Imports on the Balance of Foreign Trade in Ghana, Mathematical Theory and Modelling Vol.4, No.8: pgs. 115-120. Yakubu, D.K., Avuglah, R.K., and Harris, E. (2014).

Application of ARIMA Models to Road Traffic Accident Cases in Ghana, International Journal of Statistics and Application Vol.4, No.5: pgs. 233-239. Avuglah, R.K., Adu-Poku, K.A., and Harris, E. (2014).

Time Series Behaviour of the Volume of Wood Products Export in Ghana, International Journal of Statistics and Probability Vol.3, No.4: pgs. 12-24. Acquah, B.S., Avuglah, R.K., and Harris, E. (2014).

Modelling Road Traffic Fatality Cases in Ghana, Mathematical Theory and Modelling Vol.4, No.13: pgs. 113-120. Adu-Poku, K.A., Avuglah, R.K., and Harris, E. (2014).

Allocation of Assets on The Ghana Stock Exchange, International Journal of Financial Research Vol.4, No.2: pgs. 108-114. Mensah L., Avuglah, R.K., and Dedu, V. (2013).

Modelling Annual Coffee Production in Ghana Using ARIMA Time Series Model, International Journal of Business and Social Research, Vol.2, No.7: pgs. 175-186., Harris, E., Abdul - Aziz, A.R., and Avuglah, R.K. (2012).

Value-at-Risk based on Asymmetric GARCH-models, Avuglah R.K., Master Thesis, Technical University of Kaiserslautern, Germany, (2003).

Some methods of solving 2nd order Non-Homogeneous Linear Ordinary Differential Equations, Avuglah R.K., Undergraduate Dissertation, University of Cape Coast, Ghana, (1999).

POSITIONS AT KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY (KNUST), KUMASI

November 1, **Unity Hall of Residence, KNUST.**, Kumasi, Ghana
2022-Date Hall Master

September 1, **Unity Hall of Residence, KNUST.**, Kumasi, Ghana
2020- Senior Tutor

October 31,
2022

January 1, **Council of Convocation, KNUST.**, Kumasi, Ghana
 2020- Chairman
 December 31,
 2021.

January 1, **Council of Convocation, KNUST.**, Kumasi, Ghana
 2018- Member
 December 31,
 2019.

August 1, **Department of Statistics and Actuarial Science, KNUST.**, Kumasi, Ghana
 2019- Examinations Officer, Distance Learning Programmes
 December 31,
 2021.

August 1, **Department of Mathematics, KNUST.**, Kumasi, Ghana
 2016- July Head
 31, 2017

July 22, **College of Science, KNUST.**, Kumasi, Ghana
 2015- July Representative on the Board of the International Programmes Office
 31,2020.

May 22, **Department of Mathematics, KNUST.**, Kumasi, Ghana
 2012- Examinations Officer for Postgraduate Programmes
 December 31
 2015.

SCHOLARSHIPS

PhD German Academic Exchange Service, DAAD
 Candidacy at
 RPTU
 Kaiserslautern-
 Landau,
 Germany.

Visiting German Academic Exchange Service, DAAD
 Scholar at
 RPTU
 Kaiserslautern-
 Landau,
 Germany;
 09/2023-12/2023

EMPLOYMENT HISTORY

August **Kwame Nkrumah University of Science and Technology**, Kumasi, Ghana
 2025–Date Associate Professor

August **Kwame Nkrumah University of Science and Technology**, Kumasi, Ghana
 2015–July Senior Lecturer
 2025

August 2006–July 2015 **Kwame Nkrumah University of Science and Technology**, Kumasi, Ghana
Lecturer

December 2007–June 2011 **Fraunhofer Institute for Industrial Mathematics**, Kaiserslautern, Germany
Research Assistant

September 2004–July 2006 **Blessed Training Centre**, South Wimbledon, London, United Kingdom
Mathematics Teacher

September 1999–March 2001 **St. John’s Grammar Senior High School**, Achimota, Accra, Ghana
Mathematics Teacher

October 1993–January 1995 **St. Lawrence Preparatory/Junior High School**, North Kaneshie, Accra, Ghana
Teacher

October 1992–August 1993 **National Council on Women and Development (NCWD)**, Ho, Ghana
National Service Person

COMPUTER SKILLS

Mathematical and Statistical Packages
MATLAB, R, Python, SPSS

Others \LaTeX , Microsoft Office Suite

SELECTED INTERNATIONAL CONFERENCES ATTENDED

30 August – 2 September 2011 **Designed Experiments: Recent Advances in Methods and Applications (DEMA2011)**, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK

3 December – 4 December 2008 **Cross-Border Workshop for PhD Mathematics Students**, Département de Mathématiques and the Laboratoire de Mathématiques et Applications, Metz, France

12 November – 14 November 2008 **Flexible Modelling: Smoothing and Robustness (FMSR2008)**, Katholieke Universiteit, Leuven, Belgium

11 August–15 August 2008 **Designed Experiments: Recent Advances in Methods and Applications (DEMA2008)**, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK

14 January–15 January 2008 **International Conference on Design of Industrial Experiments**, University of Antwerp, Belgium

PROFESSIONAL ASSOCIATIONS

Member International Biometric Society
Member Ghana Statistical Association

LANGUAGES

GHANAIAN LANGUAGES

Ewe, Twi, Fluent
Ga

FOREIGN LANGUAGES

English Fluent *English is the official Language in Ghana. I studied in English throughout my education*
German Higher Basic level *Language classes taken at Goethe Institute in Accra, Ghana and RPTU Kaiserslautern-Landau, Germany*

HOBBIES

I enjoy traveling, music, politics, athletics, soccer, tennis.

REFERENCES

Professor Isaac Kwame Dontwi

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Professor Joseph Ackora-Prah

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