

Richard Kodzo
AVUGLAH, Ph.D

Department of Statistics and Actuarial Science
Kwame Nkrumah University of Science and Technology (KNUST)
Kumasi, Ghana

☎ +233 233 677677

☎ +233 248 828485

Associate Professor

✉ rkavuglah.cos@knust.edu.gh, avuglah@yahoo.com, avuglah@gmail.com

PROFESSIONAL PROFILE

Accomplished Statistician, Researcher, and University Academic with extensive expertise in Applied Mathematical Statistics, Financial Statistics, Financial Mathematics, and Actuarial Science.

Over 18 years of university teaching, research supervision, academic leadership, and consultancy experience at Kwame Nkrumah University of Science and Technology (KNUST) and international institutions.

Demonstrated research excellence with strong publications in statistical modelling, financial risk analysis, machine learning applications, copula modelling, time series analysis, and applied probability.

Passionate about mentoring students, interdisciplinary collaboration, and advancing statistical research and education.

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 **G.C.E./S.C. O'Level**, *Bishop Herman College*, Kpando, Ghana

1985–June
1990 Subjects: English Language, Modern Mathematics, Additional Modern Mathematics, Physics, Chemistry, Biology, Economics, Geography.

September **Common Entrance Examinations**, *Harrow International Preparatory School*,
1979–August *Abeka*, Accra, Ghana
1985

AREAS OF SPECIALIZATION

Applied Mathematical Statistics, Financial Statistics, Financial Mathematics Experimental Design and Actuarial Science

RESEARCH INTERESTS

Statistical Modelling, Financial Modelling, Time Series Analysis, Copula Models, Applied Probability, Machine Learning Applications

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., Nsowah-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).

Some Steps towards Experimental Design for Neural Network Regression, Avuglah R.K., PhD Thesis, RPTU Kaiserslautern-Landau, Germany, (2011).

Value-at-Risk based on Asymmetric GARCH-models, Avuglah R.K., Master Thesis, RPTU Kaiserslautern-Landau, 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).

ACADEMIC AND ADMINISTRATIVE POSITIONS

- November 1, **Unity Hall of Residence, KNUST.**, Kumasi, Ghana
2022-Date Hall Master
- September 1, **Unity Hall of Residence, KNUST.**, Kumasi, Ghana
2020- Senior Hall 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 of Department
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.

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

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

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

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

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

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

SCHOLARSHIPS AND ACADEMIC VISITS

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

COMPUTER SKILLS

Statistical R, MATLAB, Python, SPSS
 and Mathe-
 matical
 Packages

Others \LaTeX , Microsoft Office Suite

SELECTED INTERNATIONAL CONFERENCES ATTENDED

- 30 August – **Designed Experiments: Recent Advances in Methods and Applications**
2 September (DEMA2011), Isaac Newton Institute for Mathematical Sciences, Cambridge, UK
2011
- 3 December – **Cross-Border Workshop for PhD Mathematics Students**, Département de
4 December Mathématiques and the Laboratoire de Mathématiques et Applications, Metz, France
2008
- 12 November **Flexible Modelling: Smoothing and Robustness (FMSR2008)**, Katholieke
– 14 Universiteit, Leuven, Belgium
November
2008
- 11 August– **Designed Experiments: Recent Advances in Methods and Applications**
15 August (DEMA2008), Isaac Newton Institute for Mathematical Sciences, Cambridge, UK
2008
- 14 January– **International Conference on Design of Industrial Experiments**, University of
15 January Antwerp, Belgium
2008

PROFESSIONAL ASSOCIATIONS

- Member International Biometric Society
Member Ghana Statistical Association

LANGUAGES

GHANAIA N LANGUAGES

- Eve Fluent
Twi Fluent
Ga Fluent

FOREIGN LANGUAGES

- English Fluent
German Basic Proficiency

HOBBIES

- Research and Academic Writing
Travel
Music
Politics
Athletics
Soccer
Tennis

REFERENCES

Professor Nana Kena Frempong

Department of
Statistics and Actuarial Science
KNUST
Kumasi
Ghana

Phone: +233 (0)202999488
Email: nkf.cos@gmail.com

Professor Isaac Kwame Dontwi

Department of Mathematics
KNUST
Kumasi
Ghana

Phone: +233 (0)208271417
Email: ikedontwi@hotmail.com

Professor Sylvester Kojo Danuor

Department of Physics
KNUST
Kumasi
Ghana

Phone: +233 (0)244629832
Email: danuor@yahoo.com

Professor Joseph Ackora-Prah

Department of Mathematics
KNUST
Kumasi
Ghana

Phone: +233 (0)208180547
Email: ackoraprah@yahoo.co.uk

UPDATED

May 9, 2026