Curriculum vitae: Caston Sigauke

University of Venda
Department of Mathematical
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Educational Qualifications

PhD	University of the Free State, South Africa	2014
MSc	National University of Science and Technology, Zimbabwe	2000

Professional Qualifications

Jan 1990 - Dec 1992	Institute of Chartered Secretaries and Administrators in Zimbabwe (ICSAZ) Intermediate Certificate, Zimbabwe.

Professional Experience

May 2023 - Present	Associate Professor, Department of Mathematical and Computational Sciences https://www.univen.ac.za/faculties/science-engineering-and-agriculture/mathematica
Oct 2015 - April 2023	Senior lecturer, Department of Mathematical and Computational Sciences University of Venda.
Jun 2018 - Feb 2020	Board Member of the Institute of Certificated and Chartered Statisticians of South Africa (ICCSSA).
Oct 2015 - Dec 2018	Honorary Research Associate, School of Statistics and Actuarial Science University of the Witwatersrand, South Africa.
Sep 2013 -Sep 2015	Lecturer, School of Statistics and Actuarial Science, University of the Witwatersrand, South Africa.
May 2009 - Aug 2013	Lecturer, Department of Statistics and Operations Research, University of Limpopo, South Africa.
Apr 2002 - Apr 2009	Lecturer, Department of Applied Mathematics, National University of Science and Technology, Zimbabwe.
Jan 2000 - Dec 2008	Part-time lecturer, Zimbabwe Open University, Zimbabwe.

University Administrative Duties

- Departmental Higher Degrees Committee chairperson (Department of Mathematical and Computational Sciences) (January 2024 - July 2025).

- Faculty Higher Degrees Committee – Non-Examining Chairs (FHDC – NEC) Subcommittee member (June 2022-April 2024).

- Faculty Research and Innovation Integrated Committee (FRIIC) member (Faculty of Science, Engineering and Agriculture) (April 2024-Date).

Academic Citizenship and Community Engagement

2024-Date   Chairperson of the Forecasting Interest Group (FIG), South Africa
Chapter of the International Institute of Forecasters
`https://forecasters.org/programs/communities/forecasting-interest-group-south-africa/`

2024- Date   Chairperson of the Forecasting Interest Group (FIG) in the South African Statistical Association.
`https://www.sastat.org/groups/forecasting`

2023   Panel member for the Mathematics, ICT, Physics and Astronomy-CPRR, CSUR & Y-Rated 2023 NRF funding proposals.

NRF rating

2025-2029   South African National Research Foundation C2 Rated Researcher.
`https://www.nrf.ac.za/information-portal/nrf-rated-researchers/`

Honours and Awards

2025   Awarded the CoE-MaSS grant for the Univen-UL joint symposium.
Grant Ref No.: 2025-022-MEC Limpopo Symposium 2025. Value of award R111,60.00.

2024   Awarded the CoE-MaSS grant for a writing retreat.
Grant Ref No.: 2024/060-MEC-Maths and Computational Sciences Retreat. Value of award R49,200.00.

2024   University of Venda Vice Chancellor's award for the 2022 research outputs.

2023   University of Venda Vice Chancellor's award for the 2021 research outputs.

2022   University of Venda Vice Chancellor's award for the 2020 research outputs.

2019   Awarded the World Bank Trust Fund for Statistical Capacity Building (WB TFSCB)
to participate in the 62nd ISI World Statistics Congress in Kuala Lumpur, Malaysia.

2019   Awarded a University of Venda research grant in the niche area: Sustainable Rural and
Regional Development. Value of Award R147,754.00.

2018   Knowledge Share award: SASA/NRF Academic Statistics in Crisis. Value of Award R20,000.00.

2016   Knowledge Share award: SASA/NRF Academic Statistics in Crisis. Value of Award R15,000.00.

2016   Awarded the DST-NRF Centre of Excellence in Mathematical and Statistical Sciences (CoE-MaSS)
for funding a Workshop on Quantile Regression. Value of award R30,000.00.

2015-2017   Awarded the National Research Foundation (NRF) grant for Competitive Support for Unrated
Researchers (CSUR). Project title "Probabilistic Load Forecasting". Value of award R728,500.00.

2015   Awarded the Faculty of Science Research start-up grant (Faculty of Science, University of Witwatersrand).
Value of award R30,000.00.

2014   Awarded the Faculty of Science Research start-up grant (Faculty of Science, University of Witwatersrand).
Value of award R30,000.00.

2014   Awarded the Dean's Research grant (Faculty of Science, University of Witwatersrand).
Value of award R25,000.00.

2014   Vice Chancellor's research support (University of Witwatersrand). Value of award R15,000.00.

2012   Excellence award for being the best researcher in the School of Mathematical and Computer
Sciences at the University of Limpopo, South Africa in 2012. Value of award R10, 000.00.

2011   Awarded the Knowledge Interchange Collaboration (KIC) travel grant by National Research
Foundation (NRF) of South Africa to attend IFORS conference in Melbourne, Australia.
Value of award R15,000.00.

Current Membership of Professional Associations

- Professional Natural Scientist in Statistical Science: South African Council for Natural Scientific Professions (SACNASP). Registration Number: 157375. https://www.sacnasp.org.za/

- International Institute of Forecasters (IIF). Member ID: 7178.
  `https://forecasters.org/blog/2023/10/09/member-profile-caston-sigauke/`

- International Statistical Institute (ISI). Member ID: 16577. `https://www.isi-web.org/`

- South African Statistical Association (SASA). Membership ID: 1504211. `https://www.sastat.org/`

- I have peer-reviewed more than 90 journal articles from the following journals `https://orcid.org/0000-0002-7406-5291`: Communications in Statistics - Theory and Methods; Applied Energy; IEEE Access; IEEE PES Transactions on Power Systems; IEEE Access; Entropy (MDPI); Forecasting (MDPI); Sensors (MDPI); Renewable & Sustainable Energy Reviews; SN Applied Sciences Springer Nature; Plos ONE; International Journal of Modelling and Simulation; Statistics, Optimization & Information Computing; South African Statistical Journal; International Journal of Electrical Power and Energy Systems; Journal of Energy in Southern Africa; Physica A: Statistical Mechanics and its Applications; Journal of Applied Statistics; Journal for Studies in Economics and Econometrics; Sustainable Cities and Society; Journal of Probability and Statistics; Journal of Disaster Risk Studies.

  `https://www.webofscience.com/wos/author/record/1901098`

- **Editorial Board**
  2024 - Date: Associate Editor of Journal of Graphic Era University. `https://www.journal.riverpublishers.com/index.php/JGEU/eb`

  2024 - Date: Associate Editor for Production Journal `https://prod.org.br/board`

Research

My research is on spatio-temporal predictive modelling with applications in renewable energy (solar and wind) systems and environmental systems.

Field of Specialisation

Statistics

Fields of academic interests

My research interests are in: Spatial extremes modelling, Statistical learning and modelling, Time series analysis, Exploratory data analysis.

Postgraduate Supervision

I have supervised students' dissertations at undergraduate and post-graduate levels in statistics. I have supervised more than 25 honours projects, 27 Masters's students, of which 18 I am the main supervisor and 9 as a co-supervisor, and 8 PhD students (4 as main supervisor and 4 as a co-supervisor) to completion. I currently supervise 5 PhD students, 3 as the main supervisor and 2 as a co-supervisor.

MSc - Completed

MSc by research dissertation (Main Supervisor)

1. Predicting price volatility of cryptocurrency Ethereum. Vhukhudo R Rambevha (University of Venda) 2025.

2. Hierarchical forecasting of monthly electricity demand. Ignitious Chauke (University of Venda) 2022.
   https://univendspace.univen.ac.za/items/a7771d13-6591-49db-ac0d-a5a2abb1edc0/full

3. Forecasting wavelet de-noised global horizontal irradiance using attention-based long short-term memory network Ndamulelo I Nelwamondo (University of Venda) 2022.
   https://univendspace.univen.ac.za/items/aefe917c-fcca-43f0-b9bf-f861ed79ff3e/full

4. Renewable energy forecasting in South Africa. Mamphaga Ratsilengo (University of Venda) 2021.
   https://univendspace.univen.ac.za/items/bd40862e-d4c2-4093-8f62-d9ec7e5016a6/full

5. Forecasting hourly solar irradiance in South Africa using machine learning models. Tendani Mutavhatsindi (University of Venda, South Africa), 2020.
   https://univendspace.univen.ac.za/items/db24bdcd-f97b-4801-9aa4-821cf7a8a65b/full

6. Short-term wind power forecasting in South Africa using neural networks. Lucky Oghene-chodja Daniel (University of Venda, South Africa), 2020.
   https://univendspace.univen.ac.za/items/9665c097-ce09-49e7-82a3-ad4cae8c8b84/full

7. Forecasting hourly electricity demand in South Africa using machine learning models. Maduvhahafani Thanyani (University of Venda, South Africa), 2020.
   https://univendspace.univen.ac.za/items/8a7fd0c2-85cd-4a87-bdaf-295b1e7f3800/full

8. Hierarchical forecasting of electricity demand in South Africa. Rofhiwa Netshiomvani (University of Venda, South Africa), 2020.
   https://univendspace.univen.ac.za/items/6e452a85-e19d-44c2-b4b6-66a9f3086a21/full

9. Probabilistic solar power forecasting: An application to South African data. Phathutshedzo Mpfumali (University of Venda, South Africa), 2019. She was on the NRF project on Probabilistic Load Forecasting (2015-2017).
   https://univendspace.univen.ac.za/items/ab317d0c-e8c9-47d4-9d90-10fc6891891f/full

10. Modelling the extremal dependence structure of equity returns: A survey of four African equity markets. Richard Taiwo Abayomi Samuel (University of Venda, South Africa), 2019.
    https://univendspace.univen.ac.za/items/cfc68cbe-2c55-4b7e-b232-7178039a811a/full

11. Forecasting foreign direct investment in South Africa using nonparametric quantile regression models, by Nyawedzeni Netshivhazwaulu (University of Venda, South Africa), 2019.
    https://univendspace.univen.ac.za/items/8bcbd99b-eb43-4455-81cf-95f81ba29d2d/full

12. Short-term load forecasting using quantile regression with an application to the unit commitment problem, by Moshoko Emily Lebotsa (University of Venda, South Africa), 2018. Was on NRF project on Probabilistic Load Forecasting (2015-2017).
    https://univendspace.univen.ac.za/items/e1340e72-485d-49c3-8476-4bee4e72f0c3/full

13. Medium-term load forecasting using generalised additive models with tensor product interactions. Thakhani Ravele (University of Venda, South Africa), 2018.
`https://univendspace.univen.ac.za/items/de22694e-458c-4519-b79d-f28424bdb3a0/full`

14. Stochastic modelling of daily peak electricity demand using extreme value theory Jerry Boano Danquah (University of Venda, South Africa), 2018. Was on NRF project on Probabilistic Load Forecasting (2015-2017).
`https://univendspace.univen.ac.za/items/dc949695-148e-42f9-b5d0-357a604ff647/full`

15. Short-term hourly load forecasting in South Africa using neural networks by Elvis Tshiani Ilunga (University of the Witwatersrand, Johannesburg, South Africa), 2018. `http://wiredspace.wits.ac.za/xmlui/handle/10539/25629`

16. Modelling annual flood heights of the Limpopo river at Beitbridge border post using extreme value theory, by Robert Kajambeu (University of Venda, South Africa), 2017.
`https://univendspace.univen.ac.za/items/0c32e9b4-c527-4b94-98f5-bea1980233c1/full`

17. Modelling temperature in South Africa using extreme value theory by Murendeni Maurel Nemukula (University of the Witwatersrand, Johannesburg, South Africa), 2017. Nemukula was on the NRF project on Probabilistic Load Forecasting (2015-2017). `http://wiredspace.wits.ac.za/handle/10539/24840`

18. Modelling short-term probabilistic electricity demand in South Africa by Molete Mokhele (University of the Witwatersrand, Johannesburg, South Africa). Molete was on the NRF project on Probabilistic Load Forecasting, 2016. `http://wiredspace.wits.ac.za/handle/10539/21021`

MSc by research dissertation (Co-Supervisor)

1. Short-term forecasting of global horizontal irradiance using stacked ensemble machine learning algorithms. Fhulufhelo Walter Mugware (University of Venda) 2025.

2. Forecasting minute averaged solar irradiance using machine learning for solar concentrator applications. Ronewa Collen Nemalili (University of Venda) 2022. `https://univendspace.univen.ac.za/handle/11602/2494?show=full`

3. Multilevel modelling of determinants of contraceptive method choice among women in South Africa. Nematswerani Phumudzo (University of Venda) 2021.
`https://univendspace.univen.ac.za/items/4a5a2095-b990-41ce-a813-eb561b91b8e5/full`

4. A Bayesian multilevel model for women unemployment in South Africa. Vutshilo Ramarumo (University of Venda) 2021.
`https://univendspace.univen.ac.za/items/26aa213d-4f1b-49e3-8b09-46e7ddce691c/full`

5. Variable selection in discrete survival models. Coster Mabvuu (University of Venda, South Africa), 2020.
`https://univendspace.univen.ac.za/items/6ca3baf7-285a-490a-976f-eea4fe599694/full`

6. Variability and long-term trends of climate extremes over the Limpopo, South Africa by Thendo Sikhwari (University of Venda, South Africa), 2019. `http://univendspace.univen.`

`ac.za/handle/11602/1485?show=full`

7. A comparison of some methods of modelling the baseline hazard function in discrete survival models by Mahlageng Retang Mashabela (University of Venda, South Africa), 2019.
`https://univendspace.univen.ac.za/items/33b3d725-e782-4cb0-a02d-f91cf040ad12/full`

8. Discrete survival models with flexible link functions for age at first marriage among women in Swaziland. Thambeleni Portia Nevhungoni, 2019.
`https://univendspace.univen.ac.za/items/74b56340-c2d7-4b17-9340-854b5a9e9700/full`

9. Modelling Volatility and Financial Market Risks of Shares on the Johannesburg Stock Exchange by Monnye Rhoda Makhwiting (University of Limpopo, South Africa), 2014. `http://ulspace.ul.ac.za/handle/10386/1389`

PhD - Completed

PhD (Main Supervisor)

1. Thakhani Ravele - Probabilistic renewable energy modelling in South Africa. University of Venda, South Africa, 2024.
`https://univendspace.univen.ac.za/items/07930251-efab-4d0f-84eb-9d1b8f639c0e/full`

2. Norman Maswanganyi - Long term peak electricity demand forecasting in South Africa using quantile regression (2024). University of Venda.
`https://univendspace.univen.ac.za/items/6814456d-8da6-4ad6-aa3e-49d7e1a262cb/full`

3. Edina Chandiwana - Solar power forecasting using Gaussian process regression. University of Venda, South Africa, 2023.
`https://univendspace.univen.ac.za/items/30d97325-b89a-45d9-a6eb-699cb67441fe/full`

4. Rosinah M Mukhodobwane - Modelling volatility, equity risk and extremal dependence of the BRICS stock markets. (University of Venda, South Africa), 2021.
`https://univendspace.univen.ac.za/items/a62652ed-93b2-42ce-a038-fb4b625d66f1/full`

PhD (Co-Supervisor)

1. Richard A. Samuel - Stochastic modelling of volatility, leverage effects, long-memory and extremal dependence of financial markets. University of the Witwatersrand, Johannesburg, 2024.

2. Ndava Constantine Mupondo - Modelling Zimbabwean stock market liquidity and volatility. National University of Science and Technology, Zimbabwe, 2022. `http://www.nust.ac.zw`

3. Fhumulani I Mativha - Drought in Luvuvhu river catchment: Assessment, characterisation and forecasting. (University of Venda, South Africa), 2020. `http://univendspace.univen.ac.za/handle/11602/1522?show=full`

4. Daniel Nheta - Entrepreneurship gaps framework: An investigation into expectations vs. realities of entrepreneurship. (University of Venda, South Africa), 2020. `http://univendspace.univen.ac.za/handle/11602/1533?show=full`

PhD - Current students (Main supervisor)

1. Thinawanga Tshisikhawe - Spatio-temporal Modelling of Wind Energy Data Using Bayesian Inference (2024-). University of Venda.

2. Godfrey Mtunzi - Modelling of Empirical Stylised Facts and Robust Parameter Estimation for Portfolio Optimisation in Unstable Financial Markets: The Case of Zimbabwe Stock Exchange. (2024-). National University of Science and Technology, Zimbabwe.

PhD - Current students (Co-supervisor)

1. Susan Maposa - A comparison of the predictive accuracy of the Pareto and power logit families of link functions in discrete survival models. (2018-). University of Venda.

2. Kholofelo M Metwane - Renewable energy production enhancement through extreme value theory modelling of complex natural disasters. (2024-). University of Limpopo.

Examination of Masters' dissertations and PhD theses

I have examined more than 16 Masters's dissertations and 9 PhD theses.

PhD theses examined

- 2025: On the Development of New Generalized Heavy-Tailed and Bivariate Families of Distributions with Applications. Faculty of Science, Department of Mathematics & Statistical Sciences, Botswana International University of Science and Technology, Botswana.

- 2024: Development and Assessment of Generalized and New Families of Lifetime Distributions with Applications. Faculty of Science, Department of Mathematics & Statistical Sciences, Botswana International University of Science and Technology, Botswana.

- 2022: Stochastic Modelling of the Spread of Infectious Diseases. School of Statistics and Actuarial Science, University of the Witwatersrand, Johannesburg, South Africa.

- 2021: Statistical and deep learning methods in causal inference. School of Statistics and Actuarial Science, University of the Witwatersrand, Johannesburg, South Africa.

- 2020: Exact methods for single and multi-objective integer programming problems. Mathematical Sciences, College of Science, Engineering and Health, RMIT University, Melbourne, Australia.

- 2019: On the use of the bootstrap methods in uncovering the sampling distribution of threshold value estimates. School of Statistics and Actuarial Science, University of the Witwatersrand, Johannesburg, South Africa.

- 2019: Efficiency of the Structural Equation Model and Related Models in Validating the Theory of Planned Behaviour. Department of Statistics & Operations Research, North-West University, South Africa.

- 2017: Title of thesis: Inspection and replacement models for reliability and maintenance: Filling in gaps. School of Statistics and Actuarial Science, University of the Witwatersrand, Johannesburg, South Africa.

- 2016: Title of thesis: The relationship between electricity supply and economic growth in South Africa. Department of Economics, Nelson Mandela University, South Africa.

- 2014: Contributions to Accelerated Reliability Testing. School of Statistics and Actuarial Science, University of Witwatersrand, Johannesburg, South Africa.

Consulting

- 2012–2013 Danish Energy Management A/S: Part-time Energy efficiency monitoring expert and statistical consultant working on the project for monitoring energy efficiency and carbon dioxide emissions for the Department of Energy, South Africa, 1 January 2012 to 31 December 2013. Duties: Identify review priorities; establish data gaps; establish data collection system; methodology establishment and data gathering; refinement of methodology, collection, data handling and reporting.

- 2009–2010 Energy statistical consultant, Energy Demand Forecasting Project for Eskom, South Africa (1-07-2009 to 31-03-2010). Duties: Our task was to develop short-term forecasting models for hourly, daily and monthly electricity demand. The project was done in collaboration with the Nelson Mandela Metropolitan University.

Symposiums, Seminars, Workshops and Invited Talks Given

2025 UNIVEN-UL Mathematical and Computational Sciences symposium, 23-24 June 2025.
`https://www.univen.ac.za/news/univen-ul-mathematical-and-computational-sciences-symposium-promo`

2025 Keynote speaker at the West Africa Young Statisticians Association, Use of Statistical Models and Artificial Intelligence for Modern Research, 8-11, September, 2025, University of Ibadan, Nigeria.
`https://waysas.org/waysasv2/event-detail?id=30`

2025 Mathematics and Statistics article writing retreat at Tshipise Forever Resort, 10-12 September 2025, University of Venda

2024 A Research Retreat Uniting Master's and PhD Students in Mathematical and Computational Sciences at 2Ten Hotel, 08-09 October 2024, University of Venda

2023 Black Heroes of Statistical Research, 1-3 November 2023.
`https://blackheroesstatistics.wordpress.com/speakers/`
`https://www.youtube.com/channel/UCndecF_05icOL4fd-4YOZ-w`

2023 Modelling spatio-temporal drought risk in a changing world,
Spatial Statistics Interest Group webinar, South African Statistical Association, 24 October 2023
`https://app.glueup.com/event/modelling-spatio-temporal-drought-risk-in-a-changing-world-90257/`

2023 Faculty of Science and Agriculture research conference, University of Limpopo,
20-22 September 2023, Advancing Science through research: Global trends on data sharing and application.
`https://www.linkedin.com/feed/update/urn:li:activity:7120808523248103424/`

2020 Forecasting lecture to Eskom's Combined Forecasting Forum (CFF) on 8 December 2020.

2016 Research Seminar at Eskom on transmission and distribution network demand forecasting.

2016 Research visit to Eskom National Control Centre in Johannesburg, South Africa.

2016 ICCSSA/ORSSA/SASA breakfast seminar at Council for Scientific and Industrial Research (CSIR), Pretoria.

"Short term hourly load forecasting during the peak period using quantile regression with an

application to the unit commitment problem".

2014 Public seminar "Winter peak electricity demand modelling in South Africa". Wits University.

2013 Data validation workshop for the National Development Plan of South Africa, Vision 2030 in Pretoria.

2010 Eskom workshop on Energy, Economics Statistics and Data mining: Heritage Conference Centre, South Africa.

2009 Workshop on Forecasting and Modelling in Energy and Finance: Department of Statistics and Centre

for Energy Research, Nelson Mandela Metropolitan University, Port Elizabeth, in partnership with Eskom, South Africa. Title of paper presented: "A GARCH modelling approach to hourly electricity load forecasting".

Publications

Research Lab
`https://www.researchgate.net/lab/Forecasting-Caston-Sigauke`

PhD thesis

1. Sigauke, C. (2014). Modelling Electricity Demand in South Africa. PhD thesis. University of the Free State, South Africa. `https://scholar.ufs.ac.za/handle/11660/1569`

Refereed research papers

1. Shoko, C., Moroke, N., **Sigauke, C.** and Makatjane, K. (2025). Real-Time Forecasting of FTSE/JSE-Top40 Using Deep Neural Models: GPT-SNN-PPO vs. LSTM. Romanian Journal of Economics. Accepted for publication on 2 October 2025.

2. Mukhaninga, M., **Sigauke, C.** and Ravele, T. (2025). An Analysis of How Local Weather Patterns Are Affected by Climate Change. PrePrints. `https://www.preprints.org/manuscript/202511.0557`

3. Israel Maingo, I., Ravele, T. and **Sigauke, C.** (2025). Volatility Modelling of the JSE Top40 Index: Assessing the GAS Framework Against GARCH and Hybrid GARCH-XGBoost. Journal of Risk and Financial Management, vol 18, no. 12, 679, pp. 1–36. `https://doi.org/10.3390/jrfm18120679`

4. Urhuerhi, O.P., Udomboso, C. and **Sigauke, C.** (2025). Forecasting solar power output in Ibadan: A machine learning approach leveraging weather data and system specifications. ArXiv preprint arXiv:2508.07462 `https://doi.org/10.48550/arXiv.2508.07462`

5. Udomboso, C.G., **Sigauke, C.** and Adinya, I. (2025). Fusion Sampling Validation in Data Partitioning for Machine Learning. ArXiv preprint arXiv:2508.01325 `https://doi.org/10.48550/arXiv.2508.01325`

6. **Sigauke, C.**, Moroke, N., Makatjane, K., and Shoko, C. (2025). A Deep Learning Forecasting of Downside Risk: Application of a combined ESRNN-VAE. Frontiers in Applied Mathematics and Statistics, vol. 11, pp. 1–16. `https://doi.org/10.3389/fams.2025.1662252`

7. Mugware, F.W., Ravele, T. and **Sigauke, C.** (2025). Short-Term Predictions of Global Horizontal Irradiance Using Recurrent Neural Networks, Support Vector Regression, Gradient Boosting Random Forest and Advanced Stacking Ensemble Approaches. Computation, vol. 13, no. 3, pp. 1–25. `https://www.mdpi.com/2079-3197/13/3/72`

8. Shoko, C., **Sigauke, C.** and Makatjane, K. (2025). An Application of Ensemble Stacking in Machine Learning to Predict Short-term Electricity Demand in South Africa. Statistics, Optimization & Information Computing, vol. 13, no. 6, pp. 2412–2433. `https://doi.org/10.19139/soic-2310-5070-2170`

9. Makatjane, K., Shoko, C. and **Sigauke, C**. (2025). An end-to-end Combined Forecasting Architecture: Forecasting Stock Price Data. Journal of Statistics Applications & Probability, vol. 14, no. 1, pp. 59–75. `http://dx.doi.org/10.18576/jsap/140105`

10. Israel Maingo, I., Ravele, T. and **Sigauke, C.** (2025. A Fusion of Statistical and Machine Learning Methods: GARCH-XGBoost for Improved Volatility Modelling of the JSE Top40 Index. International Journal of Financial Studies, vol. 13, no. 3, pp. 1–30 `https://doi.org/10.3390/ijfs13030155`

11. Mukhaninga, M., Ravele, T. and **Sigauke, C.** (2025). Short-Term Forecasting of the JSE All Share Index Using Gradient Boosting Machines. Economies, vol. 13, no. 8, 219 pp. `https://doi.org/10.3390/economies13080219`

12. Israel Maingo, I., Ravele, T. and **Sigauke, C.** (2025. Volatility Modelling of the Johannesburg Stock Exchange All Share Index using the family GARCH model. Forecasting, vol. 7, no. 2, pp. 1–33. `https://doi.org/10.3390/forecast7020016` .

13. Shoko, C. and **Sigauke, C.** (2025). Estimation of extreme quantiles of confirmed COVID-19 cases using South African data. Statistics, Optimization & Information Computing, vol. 13, pp. 759–779. `http://www.iapress.org/index.php/soic/article/view/2079`

14. Samuel, R.T.A., Chimedza, C. and **Sigauke, C.** (2025). A Comparative Modelling of Essential Characteristics of Volatility. Journal of Statistics Applications & Probability, vol. 14, no 2, pp. 241–270. `https://www.naturalspublishing.com/ContIss.asp?IssID=2110`

15. Shoko, C. and **Sigauke, C.** (2025). A Nonparametric Approach to Early Warning Signs using COVID-19 data from South Africa. African Journal of Biomedical Research, vol. 28, no. 2, pp. 1063-1082. `https://doi.org/10.53555/ajbr.v28i2s.6261`

16. Maposa, S., Bere, A., **Sigauke, C.** and Chimedza, C. (2025). A Comparison of the Discrimination and Calibration Performance of the Pareto and Logitpower families of Link Functions in Discrete Survival Models. International Journal of Data Analysis Techniques and Strategies, vol. 17, no. 4, pp. 302–327.

17. Masache A., Maposa D., Mdlongwa P. and **Sigauke C.** (2024). Short-term forecasting of solar irradiance using decision tree-based models and non-parametric quantile regression. PLoS ONE 19(12): e0312814. `https://doi.org/10.1371/journal.pone.0312814`.

18. Makubyane, K. and **Sigauke, C.** (2024). Comparative analysis of the predictive capabilities of some machine learning models: A case study using wind speed data. Journal of Statistics Applications & Probability, vol. 13, no. 4, pp. 1–15. `http://dx.doi.org/10.18576/jsap/130414`

19. Maposa, D., Masache, A., Mdlongwa, P.and **Sigauke, C.** (2024). An evaluation of variable selection methods using Southern Africa solar irradiation data: Variable selection methods using Southern Africa solar irradiation data. Journal of Energy of Southern Africa, vol. 35, no. 1, pp. 1–23. `https://doi.org/10.17159/2413-3051/2024/v35i1a16336.`

20. Mugware, F.W., **Sigauke, C.**, Ravele, T. (2024). A Comparative Study of CNN, DAN2, Random Forest and XGBOOST in Diverse South African Weather Conditions. Forecasting, vol. 6, no. 3, pp. 672–699. `https://doi.org/10.3390/forecast6030035`

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10. **Sigauke, C**. and Dowdeswell, M., Modelling peak electricity demand using extreme value theory with time-varying parameters: An application to South African data. The 35th International Symposium on Forecasting, Riverside, California, USA, 21-24 June 2015.

11. Dowdeswell, M. and **Sigauke, C**., Non-stationary point processes and their extremes: an exploration of electricity demand in South Africa. The 9th International Conference on Extreme Value Analysis at the University of Michigan, Ann Arbor, June 15-19, 2015, USA.

12. Mokhele, M. and **Sigauke, C**., Modelling summer daily peak load demands in South Africa using discrete-time Markov chain analysis. The 9th International Conference on Extreme Value Analysis at the University of Michigan, Ann Arbor, June 15-19, 2015.

13. **Sigauke, C**. and Chikobvu, D., A Markov chain analysis of daily changes to peak electricity demand in South Africa. The 34th International Symposium on Forecasting, Economic Forecasting Past, Present and Future, Rotterdam, The Netherlands, 29 June to 2 July 2014.

14. Chikobvu, D., **Sigauke, C**. and Verster, A., Winter peak electricity load forecasting in South Africa using extreme value theory with a Bayesian flavour. Poster presented at the International Society for Bayesian Analysis, June 2012 Conference, Kyoto, Japan.

15. **Sigauke, C**. and Chikobvu, D., Modelling daily peak electricity load forecasting in South Africa using a multivariate nonparametric regression approach. 19th Triennial Conference of the International Federation of Operations Research Societies, Melbourne, Australia, July10-15 2011. Chaired the invited session FC-1: OR, Energy, and Africa in stream OR Applications in Energy.

16. Chikobvu, D. and **Sigauke, C**., Modelling daily peak electricity demand in South Africa using SARIMA and RegSARIMA models. Second Isibalo Young African Statisticians' Conference, 1-3 December 2010, Pretoria, South Africa.

17. **Sigauke, C**., An econometric study of currency crises in developing economies: the Zimbabwean case. 18th Triennial Conference of the International Federation of Operations Research Societies, Sandton Convention Centre, South Africa, July 13-18, 2008. Chaired the session MC-13 Finance Applications.

International Conferences Attended without a presentation

1. **Sigauke, C**. The 42nd International Symposium on Forecasting, virtual, July 10-13, 2022 in Oxford, England.

2. **Sigauke, C**. The 40th International Symposium on Forecasting, virtual, 26-28 October 2020. `https://isf.forecasters.org/overview/about/locations/`

3. 26-30 July 2015: IEEE Power & Energy Society General Meeting, Powering up the next generation, Denver, Colorado, USA. Attended a full-day tutorial on Energy Forecasting in the Smart Grid Era.

International Research visits

1. Research collaboration visit: Department of Statistics, University of Ibadan, Nigeria, 14-28 September 2024. "Application of max-stable processes on modelling the spatio-temporal dependence of some weather variables"

2. Research collaboration visit: Department of Statistics , National University of Science and Technology, Zimbabwe, 23 June 2024 to 8 July 2024. "Modelling complex systems in the era of big data, data sharing and collaboration and Some Good Research Habits"

3. Research collaboration visit: Department of Mathematics, University of Agostinho Neto, Angola, 26 May - 10 June 2023. "Complex climate extremes: Application of max-stable processes on modelling the spatio-temporal dependence"

4. Research collaboration visit: Department of Statistics, University of Lagos, Nigeria, 6-26 March 2023. "Modelling complex systems in the era of big data" `https://unilag.edu.ng/?p=20072` `https://unilag.edu.ng/?p=20404`

5. Research collaboration visit: Department of Mathematical Sciences, University of Malawi, 30 October 2017 to 3 November 2017. "Impact of temperature extremes on electricity demand: A case study".

6. Research collaboration visit: Lancaster Centre for Forecasting, Lancaster University, Management Science, 5 December-9, 2016. "Short-term electricity demand forecasting using quantile regression with an application to the unit commitment problem". `http://www.research.lancs.ac.uk/portal/en/people/search.html?search=Caston+Sigauke&uri=&filter=`

Computer skills

- Statistical Software: R, Eviews.

- Application: Ms Office, LATEX

- Learning Management System: Moodle, Microsoft Teams, Sakai.

- Operating System: Windows

- Reference Management Software: BibTeX

Referees

To be provided upon request.

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