

Curriculum vitae: Caston Sigauke

CONTACT

📍 University of Venda
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PROFILE My research focuses on predictive modelling, with applications in probabilistic load forecasting, renewable energy systems (solar and wind), and environmental systems.

NRF RATING

- South African National Research Foundation C2 Rated Researcher (2025–2030)
- <https://www.nrf.ac.za/information-portal/nrf-rated-researchers/>

PROFESSIONAL AFFILIATIONS

- **SACNASP:** Professional Natural Scientist in Statistical Science. Registration Number: 157375. <https://www.sacnasp.org.za/>
- **IIF:** International Institute of Forecasters. Member ID: 7178. <https://forecasters.org/blog/2023/10/09/member-profile-caston-sigauke/>
- **SASA:** South African Statistical Association. Members ID: 1504211.
- Peer Reviewer: 100+ journal articles. <https://orcid.org/0000-0002-7406-5291>
- Editorial Board: Journal of Graphic Era University (2024–Date) <https://www.journal.riverpublishers.com/index.php/JGEU/eb>; Production Journal (2024–Date) <https://prod.org.br/board>

EDUCATION

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

Professional Experience

May 2023– Present **Associate Professor**, Department of Mathematical and Computational Sciences, University of Venda. <https://www.univen.ac.za/faculties/science-engineering-and-agriculture/mathematical-and-computational-sciences/>

Oct 2023 **Senior Lecturer**, Department of Mathematical and Computational Sciences, University of Venda.

Jun 2020 **Board Member**, Institute of Certificated and Chartered Statisticians of South Africa (ICCSA).

Oct 2018 **Honorary Research Associate**, School of Statistics and Actuarial Science, University of the Witwatersrand, South Africa.

Sep 2015 **Lecturer**, School of Statistics and Actuarial Science, University of the Witwatersrand, South Africa.

May 2013 **Lecturer**, Department of Statistics and Operations Research, University of Limpopo, South Africa.

Apr 2009 **Lecturer**, Department of Applied Mathematics, National University of Science and Technology, Zimbabwe.

Jan 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 & Community Engagement

2025 **Panel Member**, Adjudication of DSTI/NRF Research Chairs in Basic Sciences.

2024–Date **Chairperson**, 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**, Forecasting Interest Group (FIG), South African Statistical Association. <https://www.sastat.org/groups/forecasting>

2023 **Panel Member**, Mathematics, ICT, Physics and Astronomy-CPRR, CSUR & Y-Rated 2023 NRF funding proposals.

PROFESSIONAL QUALIFICATIONS

- Institute of Chartered Secretaries and Administrators in Zimbabwe (ICSAZ) Intermediate Certificate (1990–1992)

COMPUTER SKILLS

- **Statistical Software:** R, Eviews
- **Applications:** MS Office, \LaTeX
- **Learning Management:** Moodle, Microsoft Teams, Sakai
- **Operating System:** Windows
- **Reference Management:** BibTeX

SPECIALISATION

- Statistics

ACADEMIC INTERESTS

- Spatial extremes modelling
- Statistical learning and modelling
- Time series analysis
- Exploratory data analysis

REFEREES To be provided upon request.

Honours & Awards

2025	CoE-MaSS grant for the Univen-UL joint symposium. Grant Ref No.: 2025-022-MEC Limpopo Symposium 2025. Value: R111,600.00
2024	CoE-MaSS grant for a writing retreat. Grant Ref No.: 2024/060-MEC-Maths and Computational Sciences Retreat. Value: 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	World Bank Trust Fund for Statistical Capacity Building (WB TFSCB) to participate in the 62nd ISI World Statistics Congress, Kuala Lumpur, Malaysia
2019	University of Venda research grant in the niche area: Sustainable Rural and Regional Development. Value: R147,754.00
2018	Knowledge Share award: SASA/NRF Academic Statistics in Crisis. Value: R20,000.00
2016	Knowledge Share award: SASA/NRF Academic Statistics in Crisis. Value: R15,000.00
2016	DST-NRF Centre of Excellence in Mathematical and Statistical Sciences (CoE-MaSS) for funding a Workshop on Quantile Regression. Value: R30,000.00
2015–2017	National Research Foundation (NRF) grant for Competitive Support for Unrated Researchers (CSUR). Project: "Probabilistic Load Forecasting". Value: R728,500.00
2015	Faculty of Science Research start-up grant, University of Witwatersrand. Value: R30,000.00
2014	Faculty of Science Research start-up grant, University of Witwatersrand. Value: R30,000.00
2014	Dean's Research grant, University of Witwatersrand. Value: R25,000.00
2014	Vice Chancellor's research support, University of Witwatersrand. Value: R15,000.00
2012	Excellence award for being the best researcher in the School of Mathematical and Computer Sciences, University of Limpopo. Value: R10,000.00
2011	Knowledge Interchange Collaboration (KIC) travel grant, National Research Foundation (NRF) of South Africa to attend IFORS conference in Melbourne, Australia. Value: R15,000.00

Postgraduate Supervision

I have supervised students' dissertations at undergraduate and post-graduate levels in statistics. I have supervised more than 30 honours projects, 31 Master's students (18 as main supervisor, 13 as co-supervisor), and 8 PhD students (4 as main supervisor, 4 as co-supervisor) to completion. I currently supervise 5 PhD students (2 as main supervisor, 3 as co-supervisor).

MSc by Research Dissertation (Main Supervisor)

1. Predicting price volatility of cryptocurrency Ethereum. Vhukhudo R Rambevhva (University of Venda) 2025. <https://univendspace.univen.ac.za/items/47f3e09c-ce65-4c8c-9676-4d0aefa1f752/full>
2. 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>
3. Hierarchical forecasting of monthly electricity demand. Ignituous Chauke (University of Venda) 2022. <https://univendspace.univen.ac.za/items/>

- a7771d13-6591-49db-ac0d-a5a2abb1edc0/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) 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 Oghenechodja Daniel (University of Venda) 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) 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) 2020. <https://univendspace.univen.ac.za/items/6e452a85-e19d-44c2-b4b6-66a9f3086a21/full>
 9. Modelling the extremal dependence structure of equity returns: A survey of four African equity markets. Richard Taiwo Abayomi Samuel (University of Venda) 2019. <https://univendspace.univen.ac.za/items/cfc68cbe-2c55-4b7e-b232-7178039a811a/full>
 10. Forecasting foreign direct investment in South Africa using nonparametric quantile regression models. Nyawedzeni Netshivhazwaulu (University of Venda) 2019. <https://univendspace.univen.ac.za/items/8bcdb99b-eb43-4455-81cf-95f81ba29d2d/full>
 11. Probabilistic solar power forecasting: An application to South African data. Phathutshedzo Mpfumali (University of Venda) 2019. (NRF project on Probabilistic Load Forecasting 2015-2017) <https://univendspace.univen.ac.za/items/ab317d0c-e8c9-47d4-9d90-10fc6891891f/full>
 12. Short-term load forecasting using quantile regression with an application to the unit commitment problem. Moshoko Emily Lebotsa (University of Venda) 2018. (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) 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) 2018. (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. Elvis Tshiani Ilunga (University of the Witwatersrand) 2018. <https://wiredspace.wits.ac.za/items/1068069c-d8da-4f7f-a971-ba6c5194abd3/full>
 16. Modelling temperature in South Africa using extreme value theory. Murendeni Maurel Nemukula (University of the Witwatersrand) 2017. (NRF project on Probabilistic Load Forecasting 2015-2017) <https://wiredspace.wits.ac.za/items/1caf75c6-04ee-4a0b-8bc4-945a50e7296f/full>
 17. Modelling annual flood heights of the Limpopo river at Beitbridge border post using extreme value theory. Robert Kajambeu (University of Venda) 2017. <https://univendspace.univen.ac.za/items/0c32e9b4-c527-4b94-98f5-bea1980233c1/full>
 18. Modelling short-term probabilistic electricity demand in South Africa. Molete Mokhele (University of the Witwatersrand) 2016. (NRF project on Probabilistic Load Forecasting) <https://wiredspace.wits.ac.za/items/b470575a-6e60-441f-86f7-7550d11acac5/full>

MSc by Research Dissertation (Co-Supervisor)

1. Modelling Extreme Forecast Errors in Wind Energy Using South African Wind Farms. Vhonani Mushadu (University of Venda) 2026.
2. Application of explainable AI and uncertainty quantification in credit risk assessment. Mulavhelesi Rambauli (University of Venda) 2026.
3. A comparative evaluation of machine learning models for stock price prediction and uncertainty estimation. Vhukhudo Nengovhela (University of Venda) 2026.
4. Exploring the dynamics of the ZAR/USD exchange rate volatility using the fGARCH and

- First-Order Beta-Skew-T-EGARCH models. Dzulani Mashavhela (University of Venda) 2026.
5. Short-term forecasting of global horizontal irradiance using stacked ensemble machine learning algorithms. Fhulufhelo Walter Mugware (University of Venda) 2025. <https://univendspace.univen.ac.za/items/bc8940f4-fd7d-48a9-9cfc-d3ee76558f2a/full>
 6. Forecasting minute averaged solar irradiance using machine learning for solar concentrator applications. Ronewa Collen Nematili (University of Venda) 2022. <https://univendspace.univen.ac.za/handle/11602/2494?show=full>
 7. 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>
 8. 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>
 9. Variable selection in discrete survival models. Coster Mabvuu (University of Venda) 2020. <https://univendspace.univen.ac.za/items/6ca3baf7-285a-490a-976f-eea4fe599694/full>
 10. Variability and long-term trends of climate extremes over the Limpopo, South Africa. Thendo Sikhwari (University of Venda) 2019. <http://univendspace.univen.ac.za/handle/11602/1485?show=full>
 11. A comparison of some methods of modelling the baseline hazard function in discrete survival models. Mahlageng Retang Mashabela (University of Venda) 2019. <https://univendspace.univen.ac.za/items/33b3d725-e782-4cb0-a02d-f91cf040ad12/full>
 12. Discrete survival models with flexible link functions for age at first marriage among women in Swaziland. Thambeleni Portia Nevhungoni (University of Venda) 2019. <https://univendspace.univen.ac.za/items/74b56340-c2d7-4b17-9340-854b5a9e9700/full>
 13. Modelling Volatility and Financial Market Risks of Shares on the Johannesburg Stock Exchange. Monnye Rhoda Makhwiting (University of Limpopo) 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, 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. University of Venda, 2024. <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, 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, 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, 2020. <https://univendspace.univen.ac.za/items/944eb62e-f60e-40a8-a7ec-2ef703cc7a91/full>
4. Daniel Nheta - Entrepreneurship gaps framework: An investigation into expectations vs. realities of entrepreneurship. University of Venda, 2020. <https://univendspace.univen.ac.za/items/d0ca518d-f3fd-4482-915f-ee49e8a17fd4/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.

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.
3. Costa Muthai - Uncertainty aware decision systems in financial and operational risk environments (2026-). University of Venda.

Examination of Masters' Dissertations and PhD Theses

I have examined more than 16 Master'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. Botswana International University of Science and Technology, Botswana.
- 2024: Development and Assessment of Generalized and New Families of Lifetime Distributions with Applications. Botswana International University of Science and Technology, Botswana.
- 2022: Stochastic Modelling of the Spread of Infectious Diseases. University of the Witwatersrand, Johannesburg, South Africa.
- 2021: Statistical and deep learning methods in causal inference. University of the Witwatersrand, Johannesburg, South Africa.
- 2020: Exact methods for single and multi-objective integer programming problems. RMIT University, Melbourne, Australia.
- 2019: On the use of the bootstrap methods in uncovering the sampling distribution of threshold value estimates. University of the Witwatersrand, Johannesburg, South Africa.
- 2019: Efficiency of the Structural Equation Model and Related Models in Validating the Theory of Planned Behaviour. North-West University, South Africa.
- 2017: Inspection and replacement models for reliability and maintenance: Filling in gaps. University of the Witwatersrand, Johannesburg, South Africa.
- 2016: The relationship between electricity supply and economic growth in South Africa. Nelson Mandela University, South Africa.
- 2014: Contributions to Accelerated Reliability Testing. University of Witwatersrand, Johannesburg, South Africa.

Symposiums, Seminars, Workshops & Invited Talks

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-promote
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_05ic0L4fd-4Y0Z-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. 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	ICSSA/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: "A GARCH modelling approach to hourly electricity load forecasting".

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, 5-9 December 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=>

Papers Presented at International Conferences

1. **Sigauke, C.** Understanding Spatio-Temporal Extremes: Max-Stable Models in Climate Change Research. The 45th International Symposium on Forecasting Beijing, China, June 29-July 2, 2025. <https://isf.forecasters.org/> https://isf.forecasters.org/wp-content/uploads/BookOfAbstracts-ISF2025a_FINAL.pdf https://isf.forecasters.org/wp-content/uploads/isf_202506_agenda.pdf
2. **Sigauke, C.** International Symposium on Current Trends in Modelling and Software Development in Data Science and Statistics, 20-23 February 2024, South African Medical Research Council, Cape Town. <https://erbiostat.wixsite.com/itp0>
3. **Sigauke, C.** Estimation of extreme conditional quantiles of global horizontal irradiance: An application using South African data. The 41st International Symposium on Forecasting, virtual, 27-30 June 2021. https://www.youtube.com/watch?v=9Wm70rq7Qpc&list=PLUxduCQo6_X396goCKSfuZQ9XK145XMum&index=66
4. **Sigauke, C., Nemukula, M.M. and Maposa, D.** Probabilistic hourly load forecasting. 62nd ISI World Statistics Congress, Kuala Lumpur, Malaysia, 18-23 August 2019.
5. **Sigauke, C., Nemukula, M.M. and Chikobvu, D.** Impact of temperature extremes on electricity demand: A case study. 21st Conference of the International Federation of Operational Research Societies, Quebec, Canada, 17-21 July 2017.
6. **Nemukula, M.M. and Sigauke, C.** Modelling average maximum daily temperature using r largest order statistics: An application to South African data. 61st ISI World Statistics Congress, Marrakech, Morocco, 16-21 July 2017.
7. **Nemukula, M.M. and Sigauke, C.** Modelling average minimum daily temperature using extreme value theory with a time-varying threshold. 10th International Conference on Extreme Value Analysis, Delft University of Technology, The Netherlands 26-30 June 2017.
8. **Sigauke, C.** Modelling the effect of heatwaves on electricity demand: A case study. The 3rd International Conference on Energy and Environment Research, Barcelona, Spain, 7-11 September 2016.
9. **Sigauke, C.** Modelling extreme non-winter peak electricity demand: An application to South African data. The 36th International Symposium on Forecasting, Santander, Spain, 19-22 June 2016.
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, July 10-15 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.

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/items/bb3b43cc-382c-42af-b08f-dfeae6a73524/full>

Publications on Renewable Energies (Solar, GHI, Wind)

1. Tshisikhawe, T.H., **Sigauke, C.**, Darikwa, T.B. and Nadarajah, S. (2026). A Hybrid Linear-Gaussian Process Framework with Adaptive Covariance Selection for Spatio-Temporal Wind Speed Forecasting. *Forecasting*, vol. 8, no. 3, pp. 1–37. <https://doi.org/10.3390/forecast8030036>
2. Nthangeni, R.I., **Sigauke, C.**, Ravele, T. and Tshisikhawe, T.H. (2026). Enhancing Short-Term Wind Energy Forecasting with XGBoost and Conformal Prediction for Robust Uncertainty Quantification. *Computation*, vol. 14, no. 3, pp. 1–27. <https://doi.org/10.3390/computation14030056>
3. Metwane, M.K.; Maposa, D.; **Sigauke, C.** (2026). Vine Copula Modelling of Extreme Temperature, Wind Speed, and Relative Humidity Towards Enhancement of Renewable Energy Production. *Mathematical and Computational Applications*, vol. 31, no. 1, 19 pp. 1–24. <https://doi.org/10.3390/mca31010019>
4. 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>
5. 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>
6. 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>
7. 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>
8. 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>
 9. Masache, A., Maposa, D., Mdlongwa, P. and **Sigauke, C.** (2024). Non-parametric quantile regression-based modelling of additive effects to solar irradiation in Southern Africa. *Scientific Reports*, vol. 14, 9244. <https://doi.org/10.1038/s41598-024-59751-8>
 10. Chandiwana, E., **Sigauke, C.** and Bere, A. (2023). Robust modelling framework for short-term forecasting of global horizontal irradiance, *Journal of Statistics Applications and Probability*, vol. 12, no. 3, pp. 1203–1221. <http://dx.doi.org/10.18576/jsap/120327>
 11. Nemalili, R.C., Jhamba, L., Kirui, J.K. and **Sigauke, C.** (2023). Forecasting hourly-averaged tilt angles of acceptance for solar collector applications using machine learning models, *Energies*, vol. 16, no. 2, 927, pp. 1–19. <https://doi.org/10.3390/en16020927>
 12. **Sigauke, C.**, Chandiwana, E. and Bere, A. (2022). Spatio-temporal forecasting of global horizontal irradiance using Bayesian inference, *Applied Sciences*, vol. 13, no. 1, pp. 1–23. <https://doi.org/10.3390/app13010201>
 13. **Sigauke, C.**, Ravele, T. and Jhamba, L. (2022). Extremal dependence modelling of global horizontal irradiance with temperature and humidity: An application using South African data, *Energies*, vol. 15, no. 16, pp. 1–25. <https://doi.org/10.3390/en15165965>
 14. Ravele, T., **Sigauke, C.** and Jhamba, L. (2022). Estimation of extreme quantiles of global horizontal irradiance: A comparative analysis using an extremal mixture model and a generalised additive extreme value model, *Mathematics and Statistics*, vol. 10, no. 1, pp. 116–133. <https://doi.org/10.13189/ms.2022.100109>
 15. Chandiwana, E., **Sigauke, C.** and Bere, A. (2021). Twenty-four-hour ahead Probabilistic Global Horizontal Irradiance Forecasting Using Gaussian Process Regression, *Algorithms*, vol. 14, no. 177., pp. 1–23. <https://doi.org/10.3390/a14060177>
 16. Ratshilengo, M., **Sigauke, C.** and Bere, A. (2021). Short-Term Solar Power Forecasting Using Genetic Algorithms: An Application Using South African Data, *Applied Sciences*, 11, 4214, pp. 1–19. <https://doi.org/10.3390/app11094214>
 17. Mutavhatsindi, T., **Sigauke, C.** and Mbuva, R. (2020). Forecasting Hourly Global Horizontal Solar Irradiance in South Africa using Machine Learning Models, *IEEE Access*, vol. 8, pp. 198872–198885. <https://doi.org/10.1109/ACCESS.2020.3034690>
 18. Daniel, L.O., **Sigauke, C.** Chibaya, C. and Mbuva, R. (2020). Short-term wind speed forecasting using statistical and machine learning methods, *Algorithms*, vol. 13, no. 6, pp. 1–30. <https://doi.org/10.3390/a13060132>
 19. Ranganai, E. and **Sigauke, C.** (2020). Capturing long-range dependence and harmonic phenomena in 24-hour solar Irradiance forecasting: A quantile regression robustification via forecasts combination approach, *IEEE Access*, vol. 8, pp. 172204–172218. <https://doi.org/10.1109/ACCESS.2020.3024661>
 20. Mpfumali, P., **Sigauke, C.**, Bere, A. and Mulaudzi, S. (2019). Day-Ahead Hourly Global Horizontal Irradiance Forecasting-Application to South African Data, *Energies*, vol. 12, no. 18, pp. 1–28. <https://doi.org/10.3390/en12183569>

Publications on Electricity and Load Demand

1. Makatjane, K., **Sigauke, C.**, Shoko, C. and Moroke, N. (2026). Real-time electricity load forecasting in South Africa using SOM-enriched deep learning ensembles. *AIMS Energy*, vol. 14, no. 2, pp. 310–334. <https://www.aimspress.com/article/doi/10.3934/energy.2026014>
2. Bashe, M., Shoko, C., Ravele, T. and **Sigauke, C.** (2026). Short-term forecasting of hierarchical time series in electricity consumption: An application using South African data. *Statistics, Optimization & Information Computing*, Online First. <http://www.iapress.org/index.php/soic/article/view/3194>
3. 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>
4. Ravele, T., **Sigauke, C.** and Jhamba, L. (2022). Economic dispatch of electrical power in South Africa: An application to the Northern Cape province, *Statistics, Optimisation and Information Computing*, vol. 10, pp. 1235–1249. <https://doi.org/10.19139/>

5. Maswanganyi, N., **Sigauke, C.** and Ranganai, E. (2021). Prediction of extreme conditional quantiles of electricity demand: An application using South African data, *Energies*, vol. 14, no. 20, 6704, pp. 1–21. <https://doi.org/10.3390/en14206704>
6. **Sigauke, C.** and Nemukula, M.M. (2020). Modelling extreme peak electricity demand during a heatwave period: a case study, *Energy Systems*, vol. 11, no. 1, pp. 139-161. <https://doi.org/10.1007/s12667-018-0311-y>
7. Boano-Danquah, J., **Sigauke, C.** and Kyei, K.A. (2020). Analysis of extreme peak loads using point processes: An application using South African data, *IEEE Access*, vol. 8, pp. 146105-146115. <https://doi.org/10.1109/ACCESS.2020.3015259>
8. Maswanganyi, N., Ranganai, E. and **Sigauke, C.** (2019). Long-term peak electricity demand forecasting in South Africa: A quantile regression averaging approach, *AIMS Energy*, vol. 7, no. 6, pp. 857-882. <http://dx.doi.org/10.3934/energy.2019.6.857>
9. Mokilane, P., Debba, P., Yadavalli, V.S.S. and **Sigauke, C.** (2019). Bayesian Structural Time Series Approach to a Long-Term Electricity Demand Forecasting. *Applied Mathematics and Information Sciences An International Journal*, vol. 13, no. 2, pp. 189-199. <http://dx.doi.org/10.18576/amis/130206>
10. **Sigauke, C.**, Nemukula, M.M. and Maposa, D. (2018). Probabilistic hourly load forecasting using additive quantile regression models, *Energies*, vol. 11, no. 9, pp. 1-21. <https://doi.org/10.3390/en11092208>
11. Lebotsa, M.E., **Sigauke, C.**, Bere, A., Fildes, R. and Boylan, J.E. (2018). Short-term electricity demand forecasting using partially linear additive quantile regression with an application to the unit commitment problem, *Applied Energy*, vol. 222, pp. 104-118. <https://doi.org/10.1016/j.apenergy.2018.03.155>
12. **Sigauke, C.** and Bere, A. (2017) Modelling non-stationary time series using a peaks over threshold distribution with time-varying covariates and threshold: An application to peak electricity demand, *Energy Journal*, vol. 119, pp. 152-166. <https://doi.org/10.1016/j.energy.2016.12.027>
13. **Sigauke, C.** (2017). Forecasting medium-term electricity demand in a South African power supply system, *Journal of Energy in Southern Africa*, vol. 28, no. 4, pp. 54-67. <https://doi.org/10.17159/2413-3051/2017/v28i4a2428>
14. **Sigauke, C.** and Chikobvu, D. (2017). Estimation of extreme inter-day changes to peak electricity demand using Markov chain analysis: A comparative analysis with extreme value theory, *Journal of Energy in Southern Africa*, vol. 28, no. 4, pp. 68-76. <https://doi.org/10.17159/2413-3051/2017/v28i4a2329>
15. Mokhele, M. and **Sigauke, C.** (2015) Modelling summer daily peak loads in South Africa using discrete-time Markov chain analysis, *Mathematics and Statistics*, vol. 3, no. 5, pp. 121-128. <https://doi.org/10.13189/ms.2015.030502>
16. **Sigauke, C.**, Verster, A. and Chikobvu D. (2013) Extreme daily increases in peak electricity demand: tail-quantile estimation, *Energy Policy Journal*, vol. 53, pp. 90-96. <https://doi.org/10.1016/j.enpol.2012.10.073>
17. Chikobvu, D. and **Sigauke, C.** (2013) Modelling influence of temperature on daily peak electricity in South Africa, *Journal of Energy in Southern Africa*, vol. 24, no. 4, pp. 63-70. <https://doi.org/10.17159/2413-3051/2013/v24i4a3147>
18. Verster, A., Chikobvu, D. and **Sigauke, C.** (2013) Analysis of the same day of the week increases in peak electricity demand in South Africa, *ORiON Journal*, vol. 29, no. 2, pp. 125-136. <https://doi.org/10.5784/29-2-120>
19. Chikobvu, D., **Sigauke, C.** and Verster, A. (2012) Winter peak electricity load forecasting in South Africa using extreme value theory, *South African Statistical Journal*, vol. 46, pp. 377-394. <https://hdl.handle.net/10520/EJC-72f927267>
20. Chikobvu, D. and **Sigauke, C.** (2012) Regression-SARIMA modelling of daily peak electricity demand in South Africa, *Journal of Energy in Southern Africa*, vol. 23, no. 3, pp. 23-30. <https://doi.org/10.17159/2413-3051/2012/v23i3a3169>
21. **Sigauke, C.** and Chikobvu, D. (2011) Prediction of daily peak electricity demand in South Africa using volatility forecasting models, *Energy Economics Journal*, vol. 33, no. 5, pp. 882-888. <https://doi.org/10.1016/j.eneco.2011.02.013>
22. **Sigauke, C.** and Chikobvu, D. (2010) Daily peak electricity load forecasting in South Africa using a multivariate nonparametric regression approach, *ORiON Journal*, vol. 26, no. 2, pp. 97-111. <https://doi.org/10.5784/26-2-89>

Publications on Weather and Meteorological Variables

1. Mukhaninga, M., **Sigauke, C.** and Ravele, T. (2026). Comparative Performance of LSTM, ANN, and GAM in Predicting Precipitation and Temperature Anomalies Under Accelerated Warming: Evidence from Thohoyandou, South Africa (1990–2025). *Earth*, vol. 7, no. 2, 57, pp. 1–26 Accepted <https://doi.org/10.3390/earth7020057>
2. **Sigauke, C.** and Ravele, T. (2024). Estimating Concurrent Probabilities of Compound Extremes: An Analysis of Temperature and Rainfall Events in The Limpopo Lowveld Region of South Africa. *Atmosphere*, vol. 15, no. 5, 557. <https://doi.org/10.3390/atmos15050557>
3. Nemukula, M.M., **Sigauke, C.**, Chikoore, H. and Bere, A. (2023). Modelling drought risk using bivariate spatial extremes: Application to the Lowveld Limpopo region of South Africa, *Climate*, vol. 11, no. 2, 46, pp. 1–24. <https://doi.org/10.3390/cli11020046>
4. Sikhwari, T., Nethengwe, N., **Sigauke, C.**, and Chikoore, H. (2022). Modelling of Extremely High Rainfall in Limpopo Province of South Africa, *Climate*, vol. 10, no. 3, 33, pp. 1–17. <https://doi.org/10.3390/cli10030033>
5. Nemukula, M.M. and **Sigauke, C.** (2021). A point process characterisation of extreme temperatures: An application to South African data, *Environmental Modelling and Assessment*, vol. 26, no. 2, pp. 163–177. <https://doi.org/10.1007/s10666-020-09718-6>
6. Maposa, D., Seimela, A.M., **Sigauke, C.** and Cochran, J.J. (2021). Modelling temperature extremes in the Limpopo province: Bivariate time-varying threshold excess approach, *Natural Hazards*, vol. 7, pp. 2227–2246. <https://doi.org/10.1007/s11069-021-04608-w>
7. Mathivha, F., **Sigauke, C.**, Chikoore, H. and Odiyo, J. (2020). Short-term and medium-term drought forecasting using generalised additive models, *Sustainability*, vol. 12, no. 10, pp. 1–20. <https://doi.org/10.3390/su12104006>
8. Kajambeu, R., **Sigauke, C.**, Bere, A., Chikobvu, D., Maposa, D. and Nemukula, M.M. (2020). Probabilistic flood height estimation of the Limpopo River at the Beitbridge using r-largest order statistics, *Applied Mathematics and Information Sciences*, vol. 14, no. 2, pp. 191–204. <http://dx.doi.org/10.18576/amis/140203>
9. Nemukula, M.M. and **Sigauke, C.** (2018). Modelling average maximum daily temperature using r-largest order statistics: An application to South African data, *Journal: JAMBA: Journal of Disaster Risk Studies*. 10(1), a467. <https://doi.org/10.4102/jamba.v10i1.467>
10. Maposa, D. Cochran, J.J., Lesaoana, M. and **Sigauke, C.**, (2014) Estimating high quantiles of extreme flood heights in the lower Limpopo River basin, Mozambique, using model-based Bayesian approach, *Natural Hazards and Earth System Sciences*, vol. 2, no. 8, pp. 5401–5425. <https://doi.org/10.5194/nhessd-2-5401-2014>

Publications on Finance and Economics

1. Fundama, S.A., Ravele, T., Tshisikhawe, T. and Caston **Sigauke, C.** (2026). Short-Term Forecasting of Four Rand-Denominated Currency Markets (EUR/ZAR, CHF/ZAR, BRL/ZAR, CNY/ZAR): A Comparative Analysis of Support Vector Regression, XGBoost and Principal Component Regression. *Risks*, vol. 14, no. 5, 97 pp. 1–32 <https://doi.org/10.3390/risks14050097>
2. Madega, F.J., Tshisikhawe, T.H., Ravele, T. and **Sigauke, C.** (2026). A Comparative APARCH Volatility Study of International Markets. *Economies*, vol. 14, no. 4, 116, pp. 1–25. <https://doi.org/10.3390/economies14040116>
3. Shoko, C., Moroke, N., **Sigauke, C.** and Makatjane, K. (2026). Real-time forecasting of FTSE/JSE-top40 using deep neural models: GPT-SNN-PPO vs. LSTM. *Romanian Journal of Economics*, 62 (1), 28–44. https://econpapers.repec.org/article/inejournal/v_3a62_3ay_3a2026_3ai_3a71_3ap_3a28-44.htm
4. Israel Mainigo, 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>
5. **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>
6. 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>
7. 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>
 8. 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>
 9. 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>
 10. 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>
 11. Rambevha, V.R., **Sigauke, C.** and T. Ravele (2024). Predicting the closing price of cryptocurrency Ethereum. *Statistics, Optimization & Information Computing*, vol. 12, pp. 1306–1324. <https://doi.org/10.19139/soic-2310-5070-2076>
 12. Samuel, R.T.A., Chimedza, C. and **Sigauke, C.** (2024). Simulation Structure for Selecting an Optimal Error Distribution Through the GAS Model. *Statistics, Optimization & Information Computing*, 12(4), pp. 1123–1148. <https://doi.org/10.19139/soic-2310-5070-1998>
 13. Samuel, R.T.A., Chimedza, C. and **Sigauke, C.** (2023). Simulation framework to determine suitable innovations for volatility persistence estimation: The GARCH Approach. *Journal of Risk and Financial Management*, vol. 16, no. 9, 392, pp. 1–30. <https://doi.org/10.3390/jrfm16090392>
 14. **Sigauke, C.**, Mukhodobwane, R., Chagwiza, W. and Garira, W. (2022). Asymptotic dependence modelling of the BRICS stock markets, *International Journal of Financial Studies*, vol. 10, no. 3, pp. 1–32. <https://doi.org/10.3390/ijfs10030058>
 15. Netshivhazwaulu, N., **Sigauke, C.** and Bere, A. (2022). Prediction of foreign direct investment: An application to South African data, *Journal of Statistics Applications & Probability*, vol. 11, no. 1, pp. 115–133. <http://dx.doi.org/10.18576/jsap/110109>
 16. Mukhodobwane, R.M., **Sigauke, C.**, Chagwiza, W. and Garira, W. (2022). Stochastic modelling of the BRICS equity markets' risks, *Journal of Statistics Applications & Probability*, vol. 11, no. 1, pp. 215–239. <http://dx.doi.org/10.18576/jsap/110117>
 17. Mukhodobwane, R.M., **Sigauke, C.**, Chagwiza, W. and Garira, W. (2020). Volatility modelling of the BRICS stock markets; *Statistics, Optimisation and Information Computing*, vol. 8, no. 3, pp. 749–772. <https://doi.org/10.19139/soic-2310-5070-977>
 18. **Sigauke, C.**, Makhwiting, R. and Lesaoana, M. (2014) Modelling conditional heteroskedasticity in JSE stock returns using the Generalised Pareto Distribution, *African Review of Economics and Finance*, vol. 6, no. 1, pp. 41–55. <https://hdl.handle.net/10520/EJC155586>
 19. **Sigauke, C.**, (2013) Volatility modelling of real GDP growth rates in South Africa, *Economics Management and Financial Markets*, vol. 8, no. 2, pp. 81–94.
 20. Makhwiting, R., Lesaoana, M. and **Sigauke, C.** (2012) Modelling volatility and financial market risk of shares on the Johannesburg Stock Exchange, *African Journal of Business Management*, vol. 6, no. 27, pp. 8065–8070.

Other Papers (Epidemiology, Tourism, Methodology, Entrepreneurship, OR, etc.)

1. Udomboso, C.G., **Sigauke, C.** and Adinya, I. (2026). Fusion Sampling Validation in Data Partitioning for Machine Learning. *Mathematics and Statistics*, vol. 14, no. 1, pp. 130–146. https://www.hrpub.org/journals/article_info.php?aid=15808
2. Shoko, C., **Sigauke, C.** and Makatjane, K. (2026) Hierarchical forecasting of COVID-19 cases in Africa using Machine Learning models. *Frontiers in Epidemiology*, 6, 1696282. <https://www.frontiersin.org/journals/epidemiology/articles/10.3389/fepid.2026.1696282/abstract>
3. Maposa, S., Bere, A., **Sigauke, C.** and Chimedza, C. (2026). 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. <https://doi.org/10.1504/IJDATS.2025.150914>

4. 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>
5. 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>
6. Shoko, C., **Sigauke, C.** (2023). Short-term forecasting of COVID-19 using support vector regression: An application using Zimbabwean data, *American Journal of Infection Control*, vol. 51, no. 10, pp. 1095–1107. <https://doi.org/10.1016/j.ajic.2023.03.010>
7. Makoni, T., Chikobvu, D. and **Sigauke, C.** (2022). Combined hierarchical tourist arrival forecasts for Great Zimbabwe National Monuments, *African Journal of Hospitality, Tourism and Leisure*, vol. 11, no. 6, pp. 2092–2102. <https://doi.org/10.46222/ajhtl.19770720.2102>
8. Shoko, C., **Sigauke, C.** and Njuho, P. (2022). Short-term forecasting of confirmed daily COVID-19 cases in the Southern African Development Community region, *African Health Sciences*, vol. 22, no. 4, pp. 534–550. <https://doi.org/10.4314/ahs.v22i4.60>
9. Bere, A., Sithuba, G.H., Mashabela, R., Mabvuu, C., **Sigauke, C.** and Kyei, K. (2021). Regularisation in discrete survival models: A comparison of Lasso and gradient boosting, *South African Statistical Journal*, vol. 55, no. 1, pp. 29-44. <https://doi.org/10.37920/sasj.2021.55.1.3>
10. Makoni, T., Chikobvu, D. and **Sigauke, C.** (2021). Hierarchical forecasting of the Zimbabwe international tourist arrivals, *Statistics, Optimisation and Information Computing*, vol. 9, no. 1, pp. 137-156. <https://doi.org/10.19139/soic-2310-5070-959>
11. Nheta, D., Shambare, R., **Sigauke, C.** and Ndivhuwo, T. (2020). Entrepreneurship gaps framework model: An early-stage business diagnostic tool, *The Southern African Journal of Entrepreneurship and Small Business Management*, 12(1), a297. <https://doi.org/10.4102/sajesbm.v12i1.297>
12. Nheta, D., Shambare, R., **Sigauke, C.** (2020). Micro-perspective lens on entrepreneurs in the early stage of business: Expectations vis-à-vis realities, *African Journal of Science, Technology, Innovation and Development*. <https://doi.org/10.1080/20421338.2020.1835175>
13. Kumar, S., Munapo, E., Ncube, O. and **Sigauke, C.**, Nyamugure, P. (2013) A minimum weight labelling method for determination of a shortest route in a non-directed network, *International Journal of System Assurance Engineering and Management*, vol. 4, no. 1, pp. 13-18. <https://doi.org/10.1007/s13198-012-0140-7>

Book Chapters

1. **Sigauke, C.** and Ravele, T. (2025). Estimating Concurrent Probabilities of Compound Extremes: An Analysis of Temperature and Rainfall Events in the Limpopo Lowveld Region of South Africa. In *Extreme Weather Events in a Warming Climate*. Edited by Masoud Rostami, Atmosphere, MDPI. <https://doi.org/10.3390/books978-3-7258-5216-1>
2. Kumar, S., Munapo, E., **Sigauke, C.** and Al-Rabeeh, M. (2020). The minimum spanning tree with node index ≤ 2 is equivalent to the minimum travelling salesman tour. In: *Mathematics in Engineering Sciences: Novel Theories, Technologies and Applications*. Edited by Ram M. CRC Press, Taylor and Francis, 1st Edition, Chapter 8. ISBN 9781351266307 https://books.google.co.za/books?id=i1auDwAAQBAJ&dq=caston+sigauke&source=gbs_navlinks_s
3. **Sigauke, C.**, Kumar S., Maswanganyi N. and Ranganai E. (2018). Reliable Predictions of Peak Electricity Demand and Reliability of Power System Management. In: *System Reliability Management: Solutions and Technologies*. Edited by Anand A. and Ram M. CRC Press, Taylor and Francis, 1st Edition, Chapter 10. ISBN 9780815360728, eBook ISBN 9781351117654 <https://doi.org/10.1201/9781351117661>

Refereed Research Papers in Accredited Conference Proceedings

1. Mokilane, P., Debba, P., Yadavalli, V.S.S. and **Sigauke, C.** (2018). Long-term electricity demand forecasting using a generalised additive mixed quantile averaging (GAMMQV) model. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, Pretoria, South Africa, 30 October – 1 November 2018. ISBN: 978-1-

5323-5947-7.

2. Nemukula, M.M., **Sigauke, C.** and Maposa, D. (2018). Bivariate threshold excess models with application to extreme high temperatures in Limpopo province of South Africa. *South African Statistical Journal: Peer-reviewed Proceedings of the 60th Annual Conference of the South African Statistical Association for 2018*, pp. 33-40.
3. Maswanganyi, N., **Sigauke, C.** and Ranganai, E. (2017). Peak electricity demand forecasting using partially linear additive quantile regression models. *South African Statistical Journal: Peer-reviewed Proceedings of the 59th Annual Conference of the South African Statistical Association for 2017*, pp. 25-32. ISBN 978-1-86822-692-4.
4. Nemukula, M.M. and **Sigauke, C.** (2015). Modelling average minimum daily temperature using extreme value theory with a time-varying threshold, *South African Statistical Journal: Peer-reviewed Proceedings of the 57th Annual Conference of the South African Statistical Association for 2015*, pp. 57-64. ISBN 978-1-86822-670-2.
5. **Sigauke, C.**, Chikobvu, D. and Verster, A. (2012) Modelling daily increases in peak electricity demand using a generalised Pareto distribution, *South African Statistical Journal: Peer-reviewed Proceedings of the 54th Annual Conference of the South African Statistical Association for 2012*, pp. 58-66. ISBN 978-1-86822-621-4.
6. **Sigauke, C.** (2011) An Econometric study of currency crisis in a hyperinflationary economy: A case study, *Proceedings of the 40th Annual Conference of the Operations Research Society of South Africa*, pp. 29-36. ISBN: 978-0-7972-1351-7.
7. **Sigauke, C.**, Maposa, D., Mudimu, E. and Nyamugure, P., (2010) Volatility modelling using ARIMA-GARCH models in a hyperinflationary economic environment: The Zimbabwean experience, *South African Statistical Journal: Proceedings of the 52nd Annual Conference of the South African Statistical Association for 2010: Special Issue 1*, pp. 1-14.