

Sbusiso Mdingi

Actuarial Science | Quantitative Research | Software Systems

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SUMMARY

Actuarial science graduate pursuing a BSc Honours in Risk Analysis at the University of the Free State. I build analytical models and the software around them, across insurance pricing, JSE portfolio analytics, financial econometrics, spatial statistics and healthcare claims integrity.

EXPERIENCE

Founder & Technical Lead | Sequin Technologies - Current

- Engineered healthcare claims-integrity technology combining claims analytics, explainable risk signals, investigator workflows and auditability, tested in synthetic claims environments.
- Designed and deployed an internal AI agent workforce of 6 production and 7 pilot agents on AWS Bedrock AgentCore across 30 infrastructure-as-code stacks, with least-privilege IAM and human-in-the-loop approval gates.
- Secured \$25,000+ in startup-programme credits from cloud and developer-tool providers (including AWS, Microsoft for Startups, Google for Startups, MongoDB, Sentry and OpenAI) to fund development and testing.

Actuarial Pricing Analyst, Vacation Work | Actuaries In The Making (AIM) - 2026

- Developed and calibrated a funeral-insurance rider pricing model across 7,280 rating combinations.
- Ran sensitivity and scenario analysis with a 61-year monthly profit-test projection.
- Presented findings to 6 Liberty actuarial staff and the wider AIM programme cohort of over 60.

Student Assistant | University of the Free State - 2023

- Facilitated computer-literacy practicals for more than 50 undergraduates, supporting Excel, Word and PowerPoint and resolving software queries.

EDUCATION & RESEARCH

MSc Financial Engineering coursework | WorldQuant University - July 2026 to present

- Admitted on conditional status.
- Financial Markets (MScFE 560): 89%, 4 credits earned; first completed module, per September 2026 transcript.

BSc Honours in Risk Analysis | University of the Free State - 2026 to present

- Nedbank bursary recipient.
- Collaborative research recovering investor risk preferences from 84 paired sector choices by 4 respondents across 7 JSE sectors.
- Fitted regularised choice models with out-of-sample predictive validation and sector-sensitivity checks.
- Dissertation submitted in September 2026.

BSc Actuarial Science | University of the Free State - 2022-2025; conferred 2026

- ASSA exemptions: A111, A112, A113.
- Nedbank bursary recipient.
- Golden Key invitation recipient.

SELECTED PROJECTS

JSE portfolio risk

- Rebuilt an R Shiny portfolio-risk app in Python, with 6 weight rules and 4 VaR/ES models.
- Fixed the rules on 2008 to 2016 and validated once on 2017 to 2026 after costs.
- Only GJR-GARCH filtered historical simulation passed the coverage backtests; live dashboard at mdingi.co.za.

Copula-GARCH pairs trading

- Designed a JSE bank pairs strategy with ARMA-GARCH margins and a Student t copula, refitted monthly.
- Fixed rules on 2010 to 2019 and validated once on 2020 to March 2026; tested GDELT news filters on BigQuery.
- Live dashboard scored on unseen data at mdingi.co.za.

Spatial statistics (SADC)

- Created a live page computing global and local Moran's I across 7 World Bank indicators for the 16 SADC countries.
- Linked D3 parallel-coordinates plot and MapLibre map; urban-population autocorrelation in 2022 was significant (Moran's I = +0.425, pseudo p = 0.0001 over 9,999 permutations).
- Ran a kriging study in R (gstat): variogram modelling, several estimators, cross-validation and conditional simulation.

Health insurance pricing

- Modelled claim frequency with Poisson and severity with lognormal distributions over a synthetic portfolio.
- Delivered an interactive Shiny app for premium estimation.

Steganography evaluation toolkit

- Encrypted LSB image steganography (AES-256-GCM) with calibrated steganalysis (chi-square and RS attacks) over a reproducible benchmark.
- Embedding is imperceptible (SSIM 0.9996 at 10% payload) yet statistically detectable (RS rate 0.12 vs 0.03 clean).
- Live demo on Azure; open source on GitHub.

METHODS & TOOLS

- Languages and tools: R, Python, Shiny, VBA, SQL, React, Git, LaTeX and ArcGIS Pro.
- Methods: statistical modelling, GLMs, Monte Carlo simulation, copulas, time series, geostatistics, spatial statistics, scenario analysis and model validation.
- Cloud and AI: AWS, Microsoft Azure, Google Cloud, cloud deployment, Amazon Bedrock and foundation models.

CERTIFICATIONS

- IBM AI Engineering (2026).
- Standard Bank Actuarial Job Simulation (2023).
- IBM Data Science, Google Data Analytics and Google IT Support (2022).

Full project case studies and public repositories: mdingi.co.za. References available on request.