Rohan Posthumus

Data Scientist/Analyst with expertise in applied science, research, programming and AI

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EXECUTIVE SUMMARY

With over 10 years at the University of the Free State, I am a data scientist specializing in enhancing student success. I have a proven record of leading high-impact projects, from developing predictive ML models for 150,000+ applications to architecting the core algorithms for a R170 million foundation partnership. I excel at translating complex data into actionable strategy and building robust, scalable data solutions.

KEY PROJECTS

NBT Predictive Algorithm & Automation Bot

Problem: During the pandemic, many students couldn't take the compulsory National Benchmark Test (NBT) for financial reasons, blocking them from registration.

Solution: I developed a Gradient Boosting Machines (GBM) algorithm to predict student academic literacy scores, allowing for exemptions. I then built a Python email bot to automate the generation and sending of 1,000+ personalized HTML notification emails per minute.

Impact: Processed over 150,000 applications, achieved 85% out-of-sample accuracy, and reduced a task that took four people weeks to just eight minutes. The algorithm is now institutionalized in the University's General Rules.

Michael Susan Dell Foundation (MSDF) Student Success Algorithms

Problem: The university needed a robust, scalable system to proactively identify at-risk students and track their progress toward career-readiness.

Solution: I authored all the core algorithms for a R170 million, 7-year partnership. This included the "Scaled Responsive Student Tracking" algorithm (an advanced early warning system) and the "Employability Tracking Algorithm" which pulls, integrates, and analyzes data to award badges as students hit milestones.

Impact: These algorithms form the foundation of the university's next-generation student success and retention strategy, directly improving graduation rates and securing a major long-term institutional partnership.

COVID-19 Engagement Analytics (40,000+ Students)

Problem: At the start of the pandemic, top management had no visibility into whether teaching and learning were happening effectively online for over 40,000 students.

Solution: I led the tracking and analysis of all online engagement (LMS access, video sessions, assessment completion, etc.). I authored 65 detailed reports that were delivered directly to top management and our rector.

Impact: The reports became a national DHET reporting requirement, were presented to the Minister of Higher Education, significantly reduced the University's risk score, and led to multi-million Rand subsidies.

EXPERIENCE

Data Scientist/Analyst

Nov 2018 - Present - 6+ years

University of the Free State, , Centre for Teaching and Learning

Researcher

Oct 2012 - Nov 2018 - 6 years 2 months

University of the Free State, , Metagenomics Platform

FORMAL EDUCATION

Level 1 exam passed in the CFA Program

2016

CFA Institute

Management Development Programme Certificate

2014

University of the Free State

Bachelor of Science (B.Sc.Hons)

2013

University of the Free State

Bachelor of Science (B.Sc.)

2011

University of the Free State

TOP 10 SKILLS

Cross contextualized thinking | Critical and creative thinking | Data analytics and statistical modeling

Data science and machine learning | Data manipulation and querying (SQL) | Programming (Python-first)

Applied science research design and execution | Communication and training (both technical and non-technical)

Project management | Adaptability and flexibility

RECENT ACHIEVEMENTS

- Tracked online engagement of over 40,000 students during Covid and wrote 65 reports that served at top management. These reports was so successful that it became a Department of Higher Education reporting requirement for all universities in South Africa during Covid. These reports significantly reduced the University's risk score and led to multi-million Rand subsidies.

- Created and deployed a machine learning algorithm to predict the Academic Literacy Scores of students since 2020, processing over 150,000 applications and making more than 10,000 predictions in 2023 with an 85% accuracy score during out-of-sample testing. Our work on the Academic Literacy predictor has also influenced the University's language policy and the NBT algorithm is now written into our General Rules policy.

- Co-presented the opening presentation for "Assessment Innovation in an AI World" conference, demonstrating ChatGPT and its implications for higher education.

- The Michael Susan Dell Foundation has partnered with the University for the next 7 years to productionize student success algorithms, with a project size of R170 million. I wrote all the algorithms for this project.

- Data officer and system admin for the student success data of the University, ensuring compliance with the protection of personal data.

- Sits on the steering committee of the University's Business Intelligence project, with direct access to the Operational Data Store.

- Data domain steward for Blackboard analytics hosted on Snowflake.

- Selected by Blackboard Inc. to be the chair of the European, Middle-East, Africa Blackboard data developers user group.

- Co-developer of Energia, an machine learning powered productivity web app.

- Won one of the Arbinger medals for being the most "outward" person in our department (an outward mindset is when you are highly aware of your group's needs, challenges, goals, and humanity and how your actions will affect them).