

Michael Cromberge CV

I am a committed Mathematics graduate with Machine Learning experience in the finance industry. I am also interested in how Mathematics can be used in other fields.

Work Experience

Lead Data Scientist [FNB] (2020-present)

Currently my role involves managing a team of Data Scientists within Data Science Engineering in FNB Digital. I provide technical oversight on current projects as well as guide business decisions on how much to leverage Auto-ML solutions such as DataRobot.

Data Scientist [FNB] (2018-2019)

This position was also in Data Science Engineering. Our first project was to create a streaming fraud detection model based on data from FNB Online. Towards getting an adaptive solution, our initial approach was unsupervised; in particular we implemented a multivariate Kalman filter on LDA outputs for each client, based on their transactional data. I contributed to this approach by writing a feature selection script which performed Fast Correlation Based Feature selection on features that had been binned (merged) according to the MDLP (Chi^2 binning) algorithm. We then explored a supervised approach, employing a combination of linear and non-linear models. I contributed to this solution by training Scikit-Learn pipelines using a custom Python class (with hyperparameter and threshold optimisation methods) as well as performing data quality checks using EDA and SHAP Python scripts. My supervised model has been taken live and has led to a reduction in queue volumes and increase in recall compared to the current manual rules based fraud system.

Quantitative analyst [FNB] (2016-2017)

This role was in the Premium Core Banking credit team. It involved descriptive and predictive analytics using SAS for the bank's retail unsecured credit products. The descriptive analytics mostly consisted of credit impairments, business cases for campaigns, analysis of product issues and monthly reporting. Regarding the predictive analytics, I built a K-means clustering model based on client transactional data; this model helped us to understand how different segments of our client base spent their money. I also built a general linear model forecasting annual client profitability; this model was going to be integrated into our client debit interest rate review tool.

Teaching assistant [Wits] (2014-2015)

This position involved tutoring second and third year Mathematics subjects together with some administrative duties. In particular I tutored Linear Algebra, Basic Analysis and Advanced Analysis to second year Mathematics major students. I also tutored second and third year Engineering Mathematics. My administrative duties included marking and invigilating tests and exams.

Tutor [Wits] (2012)

This position involved tutoring first year Biology Mathematics.

Data capturer [Hartebeestpoort Radio-Astronomy Observatory] (Dec 2011)

This was a vac work position where I processed temperature data from Venus.

Bookseller [Exclusive Books] (Jan 2008 - Jul 2009)

Programming Experience

Programming Languages:

Python (completed “Introduction to Data Science in Python” [Coursera] and “Python: Functional Programming” [Udemy]), SAS and SQL.

Cloud Computing:

AWS (completed “2019 AWS SageMaker and Machine Learning - With Python” [Udemy])

Reporting:

LaTeX, Beamer, MS Office.

Education

MSc in Mathematics with distinction [Wits] (2014-2015),

this degree was by dissertation;
supervisors of dissertation: Prof Clint Van Alten and Prof Willem Conradie,
thesis: [Algebraic Filtrations of the Modal \$\mu\$ -Calculus](#).

AIMS Masters in Mathematical Sciences with distinction [UCT] (2013),

this degree was by coursework and mini dissertation;
supervisor of mini dissertation: Prof Chris Gilmour,
thesis: [Algebraic and topological aspects associated with the construction of \$\beta X\$](#) .

BSc Maths/Physics, BSc Honours in Maths with distinction [Wits] (2008-2012).

Matric [La Salle College - Discovery] (1995-2007),

special achievements: honours blazer with scrolls for outdoor leadership, athletics, band, prefect and academics.

Awards and Scholarships

FNB Cash Retention Scheme (2018, 2019).

NRF Scare-Skills/Innovation scholarships (2012, 2013, 2014, 2015).

Post AIMS bursary (2014).

Wits postgraduate merit award (2012, 2014).

Wits Freda-Lawrenski scholarship (2012).

Eleven certificates of first class and two certificates of merit from Wits (2009-2011).

Professional Bodies

I was nominated by Wits to join the Golden Key International Honour Society in 2017.
I was a member of the South African Mathematics Society in 2014 and 2015.

Personal Recommendations

Please click the hyperlinks below left to access my personal recommendation letters.

Dr Dougan McKellar	[FNB]	dk@mckellar.info
Prof Clint Van Alten	[Wits]	clint.vanalten@wits.ac.za
Dr Bruce Bartlett	[SU/Oxford]	Bruce.Bartlett@maths.ox.ac.uk
Prof Jeff Sanders	[SU/AIMS]	jsanders@aims.ac.za
Prof Bruce Watson	[Wits]	b.alastair.watson@gmail.com
Dr Meira Hockman	[Wits]	Meira.Hockman@wits.ac.za
Prof Sheng Bau	[UKZN]	Baus@ukzn.ac.za

Hobbies

I enjoy playing the bass guitar and spending time hiking in the Drakensberg.

Personal Details

Date of Birth: 24 August 1989
Nationality: South African
ID Number: 8908245021080
Address: Fairland, Johannesburg
Email: mikebc1@gmail.com