

Thabang L. Mashinini

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Education

The University of the Witwatersrand

PHD IN COMPUTER SCIENCE

JHB, South Africa

2023 - Present

The University of the Witwatersrand

MSC IN COMPUTER SCIENCE WITH DISTINCTION

JHB, South Africa

2018 - 2019

- **Learning Level Set Method by Echo State Network for Image Segmentation.**
- Developing a novel approach for training RNNs in a computational inexpensive manner. Applied in a self-supervised learning approach for iterative image segmentation. [🔗 \(Code\)](#)

The University of the Witwatersrand

BSC HONOURS IN COMPUTER SCIENCE

JHB, South Africa

2017

- **Wildfire Estimation Using Kernel Density Estimators.**
- Predicting wildfire occurrence in South Africa using unsupervised machine learning.

The University of the Witwatersrand

BSC IN COMPUTATIONAL AND APPLIED MATHEMATICS AND ASTRONOMY AND ASTROPHYSICS

JHB, South Africa

2014 - 2016

Experience

Vodacom

SENIOR DATA SCIENTIST

JHB, South Africa

Nov. 2021 - Present

- Development and implementation machine learning solutions to optimize network and operation performance, predictive maintenance, anomaly detection, and capacity planning.
- Leading and mentoring 8 Junior data scientists grads/interns to help them develop their skills and drive impact across the organisation.
- Implemented and introduced real-time streaming data pipelines, frameworks and capabilities in the organisation.
- Collaborating with cross-functional teams, including network engineers, product managers and customer experience team.
- Selected for the Vodacom star award, which recognizes individuals who drive innovation.

IBM Research

MACHINE LEARNING RESEARCH SCIENTIST INTERN

JHB, South Africa

Apr. 2020 - Nov. 2021

- Conducted research using deep learning models, such as CNNs, RNNs, and hybrid models, to improve seasonal forecast accuracy with TensorFlow.
- Collaborated with a team of domain experts and data scientists from the United States, Brazil, South Africa, and the United Kingdom to analyze large-scale meteorological datasets, including satellite imagery and ground-based observations.
- Successfully integrated and deployed machine learning model pipelines into IBM PAIRS for operational use. [🔗 \(IBM PAIRS\)](#)
- Contributed to the initial development of the COVID-19 analytic dashboard used by the Gauteng department of health during the Covid-19 pandemic. [🔗 \(Dashboard\)](#)
- Led and mentored four PhD and one MSc interns through code reviews.
- Communicated research findings and technical insights to both technical and non-technical audiences through various means, such as publications and presentations.

Business Intelligence Service (University of the Witwatersrand)

DATA SCIENTIST INTERN

JHB, South Africa

Jun. 2018 - Apr. 2020

- Worked for a central unit that organize information and make it available to management for the purpose of understanding, planning, managing and running the university and its processes.
- Implemented and deployed a custom course recommendation system for 1st year students using K-modes clustering with a silhouette score of 90%. [🔗 Git repository](#)
- The course recommendation system resulted in the university generating a government subsidy of at least 2+ million annually.
- Introduced and implemented feature engineering and machine learning model training pipelines.
- Facilitated workshops and developed content to teach and train over 50 co-workers, external parties, and vacation students in data science and engineering.

CSIR

DATA SCIENTIST AND SOFTWARE ENGINEER INTERN

PTA, South Africa

Nov. 2017 - Jan. 2018

- Developed predictive profiling models to aid South African municipalities in improving service delivery and efficiency, achieving 75% accuracy using Support Vector Machines and 70% accuracy using Random Forest with Principal Component Analysis to identify top factors causing youth unemployment.
- Successfully deployed the system as a Django web server for use by municipal managers in Cape Town.
- Received recognition for the project [🔗 Mail and Guardian](#), [CSIR](#) and [DST](#)

ZAR X

SYSTEM ANALYST AND SUPPORT INTERN

JHB, South Africa

Jun. 2017 - Oct. 2017

- Troubleshoot and tested trading system, while modifying and updating system reports.

Skills

Programming Python, MATLAB, R, C/C++, JavaScript, LaTeX, shell, SQL, Hive

Frameworks PyTorch, TensorFlow, Scikit-learn, Spark, Git version control, Apache Kafka, Apache Flink

Back-end Django, Flask, REST API

Front-end HTML5, CSS, React, PowerBI

Areas of Expertise Signal Processing, Machine/Deep Learning, Software Engineering, Real-time DataProcessing, Data Engineering

Languages English, SeSotho, Setswana, Sepedi, Isizulu

Publications

ML-based Probabilistic Prediction of 2m Temperature and Total Precipitation

MOHAMED AKRAM ZAYTAR, BIANCA ZADROZNY, CAMPBELL WATSON, DANIEL SALLES CIVITARESE, ETIENNE EBEN

2022

VOS, THABANG MICHAEL MATHONSI, [THABANG LUKHETHO MASHININI](#)

- [🔗 paper](#)

Long-Range Seasonal Forecasting of 2m-Temperature with Machine Learning

ETIENNE E. VOS, [THABANG MASHININI](#), ASHLEY GRITZMA, SIBUSISIWE MAKHANYA AND CAMPBELL WATSON

2020

- 34th Conference on Neural Information Processing Systems [NeurIPS 2020].

- [🔗 paper](#) [poster](#)

Mine Worker Threshold Shift Estimation via Optimization Algorithms for Deep Recurrent Neural Network

MILKA C.I.MADAHANA, JOHN E.D.EKORU, [THABANG L.MASHININI](#), OTIS T.C.NYANDORO

2019

- 18th IFAC Symposium on Control, Optimization and Automation in Mining, Mineral and Metal Processing [MMM 2019]

- [🔗 paper](#)

Noise Level Policy Advising System for Mine Workers

MILKA C.I.MADAHANA, JOHN E.D.EKORU, [THABANG L.MASHININI](#), OTIS T.C.NYANDORO

2019

- 18th IFAC Symposium on Control, Optimization and Automation in Mining, Mineral and Metal Processing [MMM 2019]

- [🔗 paper](#)

Selected Projects

Covid-19 Visual Analytic Tool

IBM RESEARCH

- The purpose of the tool is to provide citizens with accurate and up-to-date data on Covid-19 in Gauteng.

- [🔗 dashboard](#)

WITS Recommendation System

[THABANG L.MASHININI](#)

- 1st year course recommendation system for the faculty of Humanities at University of Witwatersrand.
- Private project, permission granted on request.

- [🔗 code](#)

Kasi'Lam Projects

THABANG MASHININI, LEBOGANG MASHININI

- The project aims to provide townships businesses with a digital presence through web development, as a means of learning stack web development.
- [🔗 Websites](#)

Municipal Money and Youth Explorer

THABANG MASHININI, ANRI SMITH, TEBOGO LEJAKA

- Machine learning system to aid municipalities of South Africa to better measure their performance in terms of Service Delivery, Efficiency and youth employment.
- [🔗 code](#) [slides](#)

News Classification

THABANG L. MASHININI

- Classification of news headline from websites using (NLP).
- [🔗 code](#) [video](#)

Honors & Awards

COMMITTEES

2015-2017 **Wits Astronomy Club(WAC)**, Co-founder and Executive

References

Dr. **Etienne Vos (Team Lead)**, Etienne.vos@ibm.com
Mr. **Jacobus Du Toit (Team Lead)**, jacoDutoit@vodacom.co.za
MRS. **Harshila Dulabh (Team Lead)**, Harshila.Dulabh@wits.ac.za

IBM Research
Vodacom
Wits (BIS)