

# 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 7+ Junior data scientists to help them develop their skills and drive impact across the organisation.
- Implemented and introduced real-time data pipelines, frameworks and capabilities in the organisation.
- Collaborating with cross-functional teams, including network engineers, product managers and customer experience team.

### IBM Research

MACHINE LEARNING RESEARCH SCIENTIST INTERN

JHB, South Africa

Apr. 2020 - Nov. 2021

- Conducted research in the area of seasonal forecast using deep learning models, specifically CNN's, RNN's and hybrids models to improve forecast accuracy using TensorFlow.
- Collaborated with team of domain experts and data scientist from the United States, Brazil, South Africa and the United Kingdom to gather and analyze petabytes scale meteorological datasets, including satellite imagery, climate model output, and ground-based observations.
- Integration and deployment of machine learning models pipelines into IBM PAIRS [🔗 \(IBM PAIRS\)](#)
- Involved in the initial development of the Covid-19 analytic dashboard used by Gauteng department of health.
- Lead and mentored 4 PhD, 1 MSc interns through code reviews.
- Communicated research findings and technical insight to both technical and non-technical audience through, publications, 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%.
- The course recommendation model ensures the university generate a subsidy from the government of at least 2+ million annually.
- Reporting based on business requirements using SQL, SAP BO and OBIEE.
- Introduced and implemented feature engineering and machine learning model training pipelines.
- Facilitation of workshops and development of content for teaching and training 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

- Implemented Support Vector Machines with 75% accuracy to aid municipalities of South Africa to improve their service delivery, efficiency through a predictive profiling approach.
- Implemented Principal Component Analysis to identify top 5 factors out of 50 that cause youth unemployment per municipality. Then a Random Forest with a accuracy of 70% was used to predict the youth unemployment rate.
- The system was deployed as a django web server to be used by municipal managers for the city of Cape Town.
- The project was mentioned on [Mail and Guardian](#), [CSIR](#) and [DST](#)

## ZAR X

SYSTEM ANALYST AND SUPPORT INTERN

JHB, South Africa

Jun. 2017 - Oct. 2017

- Troubleshooting and testing of trading system. Modify and update system reports.

## Skills

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

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

**Back-end** Django, Flask, REST API

**Front-end** HTML5, CSS, React, PowerBI

**Areas of Expertise** Signal Processing, Machine/Deep Learning, OOP, Software Engineering, Real-time data processing/architecture design, Data Processing/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.

- Private project, permission granted on request.

- [code](#)

## Kasi'Lam Projects

THABANG MASHININI, LEBOGANG MASHININI

- I'm my attempt to learn stack web development I started these projects that helps townships businesses to have a digital footprints.
- [🔗 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

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### CERTIFICATES

- 2019 **Altron**, Power BI masterclass
- 2019 **Decision Inc**, SAP Web intelligence
- 2018 **Decision Inc**, SAP information design tool

### SCHOLARSHIPS

- 2018-2019 **Masters**, Awarded the Bank Seta MSc Scholarship
- 2017 **Honors**, Awarded the National Research Foundation (NRF) Honours Grant Bursary
- 2019 **DST Conference grant**, Travel Award to attend Deep Learning Indaba

*Nairobi, Kenya*

### COMMITTEES

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

## References

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- Dr. **Etienne Vos (Team Lead)**, Etienne.vos@ibm.com
- Mr. **Jacobus Du Toit (Team Lead)**, jacoDutoit@vodacom.co.za

*IBM Research*

*Vodacom*