

TRISTAN KUISIS

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Personal Blog - A Few Pinches of Salt - tintin305.github.io

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CURRENT

MSc electrical engineering - research

University of the Witwatersrand, Johannesburg

Braamfontein, Johannesburg, RSA

2019–Present

- *Research topic: Non-Intrusive Load Monitoring and Load Disaggregation on Distributed DC Networks*
- *Supervisors: Professors Ken Nixon and Willie Cronje*

IEC - SABS South Africa YP Representative

IEC - SABS, Pretoria

Pretoria, RSA

July, 2020–Present

- *South African representative for the IEC - SABS Young Professionals programme 2020 - 2021.*

EXPERIENCE

PeCo Power research and development engineer

University of the Witwatersrand, Johannesburg

Braamfontein, Johannesburg, RSA

April, 2019–January, 2020

- Design and implementation of a visualization and analytics platform including software development for the Pecogrid: an off-grid, low-cost, autonomous, smart energy system for rural communities based on novel highly efficient power electronic technology developed by researchers within the University of the Witwatersrand.

Electrical engineering course laboratory administrator, manager, and coordinator

University of the Witwatersrand, Johannesburg

Braamfontein, Johannesburg, RSA

2019–2020

- Introduction to Electrical Engineering - Introductory course for the engineering faculty second year students.
- Electromagnetic Engineering - Electrical engineering third year course introducing concepts of transmission lines and basic electromagnetism.
- High-Frequency Techniques - Electrical engineering fourth year course covering topics of antenna design and analysis, wireless communication, and high-frequency phenomena.

Quantum computing workshop - IBM & Wits

University of the Witwatersrand & IBM South Africa

Tshimologong Precinct, Braamfontein, RSA

April, 2019

- The course covered the basics of understanding what quantum computing encompasses, the background theory, as well as understanding quantum algorithms and how they can be applied to different areas of research and applied practically with the IBM Qiskit platform.

Final year (honours) laboratory project

University of the Witwatersrand, Johannesburg

Braamfontein, Johannesburg, RSA

July, 2018–September, 2018

- Supervised by Professor Ken Nixon
- Designed, Constructed, Tested, and Demonstrated an energy visualization and analytics portal for the University of the Witwatersrand, Johannesburg. The system is also used as a billing validator that can be used by university stakeholders in an attempt to gain greater sustainability of the university with the added visibility as well as reducing costs.

Final year (honours) design project

University of the Witwatersrand, Johannesburg

Braamfontein, Johannesburg, RSA

September, 2018 – October, 2018

- Supervised by Dr. Renier Dreyer
- Complete design and analysis of a system capable of detecting space debris in LEO (Low Earth Orbit). Utilizing phased antenna arrays with a radar theory of operation for detection. The design included the simulation of antennas and antenna arrays which also involved the economic, environmental, and business considerations for the design.

R&D engineer - Pragma

Pragma - Enterprise Physical Asset Management & Monitoring Experts

Midrand, Johannesburg, RSA
November, 2017 – January, 2018

- Designed, constructed, tested, and demonstrated an ultrasound detection unit for detecting the presence of partial discharge in medium- and high-voltage equipment in industrial settings.

The Asset Management Landscape

Pragma - Enterprise Physical Asset Management & Monitoring Experts

Midrand, Johannesburg, RSA
July, 2017

- Introduction to the ISO 55000 standard on asset management while also covering a number of other related topics including: asset management strategic planning, asset management resources, asset performance measurement and improvement, asset reliability and maintenance plans, operating and maintaining assets, asset information and asset life cycle management, organising and managing people and risk management

CHPC competition - participant and team member

Centre for High Performance Computing

Port Elizabeth, RSA
June, 2016 – July, 2016

- Introduction to working with clusters and the management of distributed compute to perform tasks while also introducing the core concepts of managing a Linux platform.
- Hardware and Software stack design.

Team Member

Engineers Without Borders (EWB)

Braamfontein, Johannesburg, RSA
February, 2016 – March, 2017

- Project design for off-grid study room for school children and schools in rural areas.

Marthinusen & Coutts - Temporary Employee

Marthinusen & Coutts (a division of ACTOM)

Cleveland, Johannesburg, RSA
November, 2015 – January, 2016

- Design, analysis, testing, and construction of electrical measurement devices for use in the factory for monitoring rotating machines.
- Mentored by Rob Melaia, the engineering and technical executive of the company on a number of projects, primarily in the R&D space.

PUBLICATIONS & RESEARCH

University of the Witwatersrand, Johannesburg

2020 International SAUPEC/RobMech/PRASA Conference - IEEE

January, 2020
Cape Town, RSA

- Paper title: Design of a 90 W Low Cost Solar Emulator for Testing MPPT Algorithms on PV Based Energy Systems
- DOI: 10.1109/SAUPEC/RobMech/PRASA48453.2020.9041107

SABS - IEC - SAIEE, Johannesburg

SAIEE WattNow Magazine Essay

September, 2020
Johannesburg, RSA

- The impact of an always connected world and industry 4.0

EDUCATION & TRAINING

University of the Witwatersrand, Johannesburg

BSc (Honours) in Electrical Engineering

2014–2018
Braamfontein, Johannesburg, RSA

Sacred Heart College

High School

2006 – 2013
Observatory, Johannesburg, RSA

ABOUT ME

- I am a firm believer in living a healthy life, this means a healthy relationship with family, friends, co-workers and acquaintances. I also believe that in order to live this healthy life I always attempt to strike a balance between: work, exercise, socialising, and rest.
- I also make sure that I always know that I can do better, improve myself as a person and this pertains to all spheres of how I live my life. I have multiple interests. I feel that if I am not always reading a book, finding out about new technology, learning something new each and every day, then I am not doing all that I can to further myself.
- I am an avid listener of a number of podcasts, these range from electronics podcasts, to general engineering podcasts, the economy, and a number of other topics that span multiple spheres of my interests. I also subscribe to countless individuals' blogs, these people come from many walks of life, some of the people are: chemists, engineers, authors, essayists, inventors, software developers, system administrators.
- On the Myers-Briggs type indicator, I am an INTJ.

Hobbies and Interests:

- Literature and reading,
- Technology and electronics,
- Blogs, podcasts, and,
- Most importantly, coffee.

Skills:

- Final year electives: high voltage, high frequency techniques, electromechanical conversion
- General skills and core competencies: During my undergraduate studies, I worked with and designed systems for a number of different use cases, some of these involve: digital and analog design, software design (software development and engineering), solar PV system design, electrical machines, measurement systems, antenna design
- Programming Languages and Tools: Python, C, C++, Microsoft Visual Basic (VBA), Delphi, Assembly, MATLAB, Processing, LaTeX, Linux, Microsoft Office Tools, VIM, HTML, CSS, JavaScript
- Data analysis tools: I have gained some experience in working with time series tools, in addition to dashboards that allow for system visualization and analysis, this includes Grafana and time series databases.
- MSc capabilities: Over the course of the work on my research, I have had to gain a deeper understanding of the tools and techniques of machine learning, particularly the area of unsupervised machine learning. Consequently, I have designed and created—for my research—a large software platform for particular use in analysing time series data which involves time series data and feature analysis as well as managing large amounts of data. My research also required the use of creation and management of virtual machines for computation, I used Azure and Google Cloud Platform for this work, which is highly flexible and beneficial to accessing compute tools from anywhere.

GENERAL

IEC - SABS South Africa Young Professional Representative

*July, 2020 – Present
Pretoria, South Africa*

SABS

*January, 2020 – Present
Pretoria, South Africa*

Member of the following technical working groups and committees: SABS TC 61 (Rotating electrical machinery working group), SABS TC 69 (Electric vehicles, road vehicles, and industrial trucks).

The South African Institute of Electrical Engineers (SAIEE)

*December, 2016 – Present
Observatory, Johannesburg, South Africa*

Member of the: Lightning Protection Section, Load Research Chapter, and the Rotating Machines Section.

REFERENCES

Professor Ken Nixon

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BSc(Eng)(Electrical), MSc, PhD (Wits), FSAIEE, MIEEE
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