

# Sahil Brijraj, Ph.D.

## Data Analyst



I am an enthusiastic solutions-orientated statistical data analyst, able to work independently and within a team framework. Highly educated, possessing a Doctorate in Physics, focusing on signal processing and data analysis. I have 13 years of experience in coding:

- extracting and processing data
- performing statistical analysis on large datasets
- automating the generation of visually creative, colourful and informative reports to present to academic and corporate institutions

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<https://www.researchgate.net/profile/Sahil-Brijraj>

Languages: English (fluent), Afrikaans, Hindi & Spanish (beginner)



- Age: 35
- Male
- Location: Durban, South Africa
- Work on-site, hybrid or remotely

### Areas of experience:



- Python, SQL, AWS
- Machine Learning
- Research
- Quantitative Analysis
- Statistical Data Analysis
- Process automation
- Data Processing
- Signal Processing
- Error Analysis
- Physics
- Geophysics
- Seismology (Large & micro-scale)
- Ionospheric wave propagation
- Lecturing

## Work Experience



### Post-Doctoral Research Fellow

The South African National Space Agency promotes research in space science and engineering. The work involves monitoring the Earth, and its surrounding environment, and using data to ensure that navigation, communication technology and weather forecasting services function as intended.

*March 2020 to April 2023 (3 years)*

- **Research role:** Developed the first regional predictive forecast model of Southern African ionospheric parameters to aid the South African National Defense Force in planning communications and the civil aviation industry in terms of hazard mitigation and communications along flight paths. (Paper submitted)
  - Field: Data processing and modelling
  - Skills: SQL, Data analysis and Python
- **Analytics role:** Developed the first-ever company code (now routinely implemented on company servers) to automatically:
  - scrub and then process data from websites and internal databases
  - perform statistical analysis
  - extract data patterns and identify outlier anomalies
  - generate formatted visually interesting and creative reports to present to action and review committees
  - Skills: Correlation, skill score and error analysis; Dbeaver, SQL, Python.

### Lecturer:

University of KwaZulu Natal (Adhoc)

*Feb 2016 to Dec 2022 (7 years)*

- **Role:** Lecturer and course coordinator.
- Managed 1st, 2nd and 3rd-year undergraduate physics students in M-stream, Life sciences and engineering.
- Conducted lectures in-person and remotely
- Classes range from 10 to 500 students

## Relevant Skills



- Python, SQL, AWS Sagemaker & Athena, Matlab, Java, R, Microsoft suite, LaTeX, Linux & Windows OS, Beamer, LibreOffice
- Automation coding of data analytical reports
- Adapting highly complex scientific data results into understandable plots and reports for non-specialists
- Historical data processing
- 3D simulations
- Signal processing
- Identifying errors and anomalies in data
- Presentations at corporate, academic and International conferences
- Writing reports
- Independent scientific research
- In-person and remote lecturing

## Training & Certificates



- Project management workshop, (2009) Vani Moodley & Associates & the Alumni Affairs Office of the University of KwaZulu-Natal
- Currently pursuing:
  - Python Certificate
  - Machine Learning certificate

# Education History



## University of KwaZulu-Natal:

- PhD (Physics) 2013-2020
  - "Full-waveform automatic location of small seismic events using a set of synthetic empirical Green's Functions in an underground mine" (first time this has been achieved)
  - **Role:** Lead independent research, data sourcing, collection, processing and presentation.
  - Format results into reports to present to non-specialists, as well as, follow strict formatting rules to publish scientific results.
  - **Resources and skills:** R, Grace, Linux, VirtualBox, LaTeX, bas scripting, automated large-scale data processing, differential evolution optimisation, 3D simulations, cost function analysis.
  - Study was carried out with and partially funded by the Institute of Mine Seismology, Stellenbosch, South Africa
- MSc (Physics) 2010-2012
  - "Investigating anomalous VLF sub-ionospheric signals that could possibly be seismic precursors." Developed a viable and promising technique for accurately predicting large earthquakes by up to two weeks.
  - **Role:** Lead independent research. Determining parameters for anomaly detection.
  - **Resources and skills:** Linux OS, great circle path analysis, seismology, VLF signal analysis, anomaly identification, report writing, preparation and presentation of results at conferences.
- BSc Hons (Theoretical physics) 2009
  - Certificate of merit for Mathematical Methods
  - Certificate of merit for Space Physics module
- BSc (Pure and Applied Physics) 2005-2008

## Scottburgh High School

- Exemption pass in Matric Senior Certificate examination (2004)

## Memberships



- Golden Key International Honours Society (2005)

## Postgraduate Scholarships and Bursaries



- National Research Foundation Postdoctoral Grant
- National Research Foundation (Innovation) Doctoral Scholarship
- South African National Space Agency (Sansa) Master Bursary
- National Institute for Theoretical Physics (NiTHEP) Postgraduate Scholarship

# Volunteer Work and Interests



- Space weather forecaster training, South African National Space Agency, 2022.
- Judge for Eskom Young Scientists Expo (2013, 2014, 2015)
- Volunteer driver for delivering food parcels to rural schools (Wakhokuhle, 2013)
- Physics practical demonstrator and teaching assistant for teachers from Northern Cape (UKZN, 2012)
- Astronomy, Archeaology, Natural disasters, Sport, Learning languages, Coding, Video Mixing Software
- Enjoy teaching, tutoring and training
- Arranged many extra classes to help students for exam prep
- Interested in charity and community outreach

## References



• Dr Suleman Moolla  
Head of Physics,  
Durban University of Technology  
Durban  
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• Dr Leigh Jarvis  
Acting Director HVDC Centre -  
(EPPEI) Eskom Power Plant  
Engineering Institute Programme  
Academic Leader, School of Electronic  
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