| **Curriculum Vitae** |  |
| --- | --- |
| **Personal Information** |  |
| Name | Gerhardt Botha |
| Address | 96 Hoffman Street, Potchefstroom, 2520, South Africa |
| Telephone | +27 67 401 6483 |
| Email | gerhardtbotha5@gmail.com |
| Nationality | South African |
| Date of birth | 29.09.1998 |
| Gender | Male |
|  |  |
| **Work Experience** |  |
| Dates | 01.01.2021 - 01.01.2022 |
| Position held | Research Intern |
| Name and address of employer | Climatology Research Group, North-West University, Potchefstroom |
| Main activities and responsibilities | Project management, data analysis, software development, technical report writing, geospatial and remote sensing analysis, air quality monitoring and research, weather radar and meteorological research, lecturing and training |
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| Dates | 01.11.2019 – 14.12.2020 |
| Position held | Research Assistant |
| Name and address of employer | Climatology Research Group, North-West University, Potchefstroom |
| Main activities and responsibilities | Research assistance, data collection and analysis, software development, geospatial and remote sensing research and analysis |
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| **Education** |  |
| Dates | 2021 - present |
| Name of organisation and location | North-West University, Potchefstroom |
| Title of qualification | Masters of Science in Environmental Science |
| Principal subjects | Remote Sensing, Air Quality, Weather Radar |
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| Dates | 2020 |
| Name of organisation and location | North-West University, Potchefstroom |
| Title of qualification | Bachelor of Science Honours in Environmental Sciences with Geography and Environmental Management (Cum Laude) |
| Principal subjects | Earth Observation, Air Quality, Disaster Risk Reduction and Climate Change Adaptation, Applied GIS |
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| Dates | 2016 - 2019 |
| Name of organisation and location | North-West University, Potchefstroom |
| Title of qualification | Bachelor of Arts in Psychology, Geography and Environmental Management |
| Principal subjects | Geography, Psychology |
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| Dates | 2012 - 2016 |
| Name of organisation and location | Highschool Garsfontein, Pretoria |
| Title of qualification | High School Diploma |
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| **Computer Skills** |  |
| Analytics | Data manipulation, visualisation and statistical analysis using Python, R and Excel |
| Programming | Python |
| GIS | ArcGIS, QGIS, Google Earth Engine, Google Maps API |
| Web development | Full Stack Development with Flask, HTML, CSS |
| Scripting | Shell scripting (BASH, TCSH) |
| Operating Systems | Linux and Windows operating systems |
| Google Workspace | Proficient in all google workspace productivity tools (Colab, Docs, Spreadsheets, Slides, Forms, etc.) |
| Virtual conferencing | Experienced in online workspace and classroom tools (Microsoft Teams, Zoom, Google Meet, WhatsApp, Slack) |
| TITAN | Configurations and administration of TITAN software for weather radar statistics and analytics |
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| **Personal Skills** |  |
| Social skills | Driven, punctual, friendly, conscientious, patient, respectful |
| Organizational skills | Committed, able to work in a multidisciplinary team under high pressure, passion for continuous learning and research |
| Technical skills | Proficient in various technologies with the ability to learn, and teach new technologies with ease |
| Driver license | Code B |
| **Field Campaigns** |  |
| Dates | 2021 |
| Project | World-Bank Source Apportionment for the Greater Johannesburg Area |
| Description | Responsible for the analysis and reporting on the continous air quality monitoring data and GIS map generation |
| Responsibilities | Data analysis, report writing, geospatial analysis, map creation |
| More information |  |
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| Dates | 09.08.2021 - 30.09.2021 |
| Project | The UAE Research Programme for Rain Enhancement Science (UAEREP) |
| Description | Provided technical support for the administration and management of weather radar analysis on the cloud server. Weather forecasting for directing field team to regions of interest. Report writing |
| Responsibilities | Weather forecasting, software development, technical report writing |
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| Dates | 21.07.2021 - 01.09.2021 |
| Project | Nova Institute Smash Block Air Quality Baseline Assessment |
| Description | Led the low-cost air quality monitoring and source apportionment campaign |
| Responsibilities | Project management, data analysis |
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| Dates | 01.09.2020 - 31.08.2021 |
| Project | Nova Institute and Anglo American Platinum Air Quality Offsets |
| Description | Led the development and deployment of low-cost air quality monitoring stations in Northam and Rustenburg, South Africa |
| Responsibilities | Project management, data management and analysis |
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| Dates | 01.02.2021 - present |
| Project | NWU Medical Research Council Vaal Low-Cost Sensor Study |
| Description | Responsible for the deployment and maintenance of various instruments, data analysis and report writing |
| Responsibilities | Data analysis, presentation |
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| Dates | 10.06.2021 - 01.07.2021 |
| Project | Gobabeb Namib Research Institute: Fog detection in the Namib desert |
| Description | Deployment of soil moisture and leaf wetness sensors in the Namib desert and gravel plains |
| Responsibilities | Instrument deployment, data analysis |
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| Dates | 14.05.2021 - 17.05.2021 |
| Project | Manhica Health Research Centre (CISM) meteorological station |
| Description | Supply and install of a meteorological station for the CISM in Mozambique |
| Responsibilities | Instrument deployment |
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| Dates | 06.10.2021 - 08.10.2021 |
| Project | National Association for Clean Air (NACA) Annual Conference 2021 |
| Description | Provided technical support for the NACA 2021 conference |
| Responsibilities | IT support |
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| Dates | 16.11.2020 - 20.11.2020 |
| Project | National Association for Clean Air (NACA) Annual conference 2020 |
| Description | Part of the technical team for the NACA 2020 conference |
| Responsibilities | IT support, virtual conference organisation |
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| Dates | 2021 |
| Project | Aerosol Robotic Network (AERONET) Cimel Sunphotometer NWU network |
| Description | Responsible for the management of the NWU sunphotometer network in Upington, Skukuza and Carletonville |
| Responsibilities | Project management |
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| **Lecturing** |  |
|  | Part-time assistant lecturer for undergraduate Climatology and postgraduate Earth Observation modules |
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| **Courses and Workshops** |  |
| Dates | 2021 |
| Name of organisation | Coursera |
| Title of course | Python for Data Analysis: Pandas & NumPy |
| Certificate | <https://coursera.org/share/24c8486bb6964ff448f0f30661c32674> |
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| Dates | 2021 |
| Name of organisation | Coursera |
| Title of course | Basic Statistics in Python (ANOVA) |
| Certificate | <https://coursera.org/share/2c497003d20e9693494352ce9d7f97e3> |
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| Dates | 2021 |
| Name of organisation | University of Michigan by Coursera |
| Title of course | Programming for Everybody (Getting started with Python) |
| Certificate | <https://coursera.org/share/324a14d82448d5a30c73c04510b76787> |
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| Dates | 2021 |
| Name of organisation | Centre for High-Performance Computing (CHPC) |
| Title of course | CHPC Linux and Python Training School for the North-West University’s Faculty of Natural Sciences |
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| Dates | 2021 |
| Name of organisation | AS Driving |
| Title of course | Defensive driver training |
| Certificate | [Defensive\_Driving.pdf](https://drive.google.com/file/d/1awHd46zFFFAS3_W5hiLtXt3l_DG4lCz0/view?usp=drivesdk) |
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| Dates | 2020 |
| Name of organisation | ESRI Web Courses |
| Title of course | Basics of map projections; Basics of geographic coordinate systems; Getting started with GIS; Deriving rasters for terrain analysis using ArcGIS; Using raster data for site selection; Introduction to surface modelling using ArcGIS; Building models for GIS analysis using ArcGIS; Preparing for network analysis; Getting started with ArcGIS Pro; Display data in ArcGIS Pro; Getting started with site scan for ArcGIS; Creating optimised routes using ArcGIS Pro; Creating 3D data using ArcGIS; Getting started with spatial analysis;Introduction to suitability modelling; 3D Visualisation techniques using ArcGIS; Distance analysis using ArcGIS; 3D Analysis of surfaces and features using ArcGIS; Displaying raster data in ArcGIS; Working with Geodatabase domains and subtypes in ArcGIS; Getting started with Geodatabase topology; Getting started with the Geodatabase; Map design fundamentals; Planning a cartography project; Working with coordinate systems in ArcGIS |
| Certificate | [ESRI\_Certificates\_2020](https://drive.google.com/drive/folders/1X7E7DpXG3b-tQxucuVG4Gg8bbU0tN9xr?usp=sharing) |
|  |  |
| **Publications** |  |
|  | Burger, R., Havenga, H., Botha, G., Frew, E.W., Axisa, D., Hirst, A., Baumgardner, D., DeVelice, T and Borenstein, S. 2022. Autonomous Navigation of Aircraft for Seeding and Evaluation of Convective Cells. *23rd Conference on Planned and Inadvertent Weather Modification,* San Antonio, TX, *American Meteorological Society*.  Hirst, C.A., Botha, G., Bird, J., Baumgardner, D. & Frew, E. 2022. Field Deployment of an Autonomous Uncrewed Aircraft System Performing Targeted Atmospheric Observations. *Field Robotics*. |
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| **Papers Presented** |  |
| Dates | 2021 |
| Name of conference | South African Society for Atmospheric Science Annual Conference |
| Title of paper | Spatio-temporal characterisation of particulate matter plumes using weather radar observations |
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| Dates | 2021 |
| Name of conference | National Association for Clean Air (NACA) 3MT |
| Title of paper | Weather radar observations of particulate plumes |
|  |  |
| Dates | 2020 |
| Name of conference | South African Society for Atmospheric Science Annual Conference |
| Title of paper | Improving radar-derived rainfall estimates of extreme events on the South African Highveld |
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| **Awards** |  |
| Dates | 2020 |
| Name of organisation | Golden Key International Honour Society |
| Award | Golden Key Academic Achievement Award |
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| Dates | 2020 |
| Name of organisation | The South African Society for Atmospheric Sciences |
| Award | 1st Place for Best Student Presentation |
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| **Community Engagement** |  |
| Date | 2021 |
| Name of project | South African Agency for Science and Technology Advancement (SAASTA) National Science Week air quality documentary titled “Science addressing air quality in South Africa” |
| Responsibilities | Contributed to SAASTA National Science Week by talking about low-cost sensors for air quality management in the documentary |
| More info | [Science addressing air quality in South Africa](https://youtu.be/tIghFFn22Nc?t=1348) |
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| **Links** |  |
| LinkedIn | [Gerhardt Botha - Environmental Science Intern - Climatology Research Group | LinkedIn](https://www.linkedin.com/in/gerhardt-botha/) |
| Personal Website | [Gerhardt Botha](https://gerhardtb.github.io/gerhardtbotha/) |
|  |  |
| **References** |  |
|  | Prof Roelof Burger |
|  | Professor, North-West University, Potchefstroom |
|  | +27 82 563 9776 |
|  | Roelof.burger@nwu.ac.za |
|  |  |
|  | Prof Stuart Piketh |
|  | Director, School for Geo- and Spatial Sciences, North-West University, Potchefstroom |
|  | +27 18 299 1582 |
|  | Stuart.piketh@nwu.ac.za |
|  |  |
|  | Dr Henno Havenga |
|  | Lecturer, North-West University, Potchefstroom |
|  | +27 74 376 2844 |
|  | hhavenga92@gmail.com |