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| Vrishti Singh  MECHATRONIC ENGINEER | DATA SCIENTIST ProfileI am a proactive and detail-oriented engineer with a strong interest in the analytical, mathematical, and software-driven aspects of technology. With experience across embedded systems, data science, and mechanical-electronic integration, I bring a systems-thinking approach to solving complex technical challenges. I thrive in both collaborative and independent environments, having contributed to cross-functional teams in engineering, research, and data-focused roles. I value clarity, efficiency, and innovation—always aiming to streamline processes and enhance the functionality of the technologies I work with.Employment HistoryData Scientist, Intellinexus, Cape Town JULY 2024 — JUNE 2025 Shadowed data scientists and engineers at a leading analytics and data science firm as part of a sponsored program. Gained practical exposure to real-world data infrastructure and enterprise tools across cloud and analytics platforms. Key areas of learning included:Observed workflows involving Snowflake, AWS, Azure, and Tableau in data analytics and reporting environments.Gained foundational understanding of data pipelines, ETL processes, and data engineering principles.Explored the use of data transfer tools and security protocols to ensure reliable and compliant data handling.Learned about the integration of cloud platforms for scalable, secure, and high-performance analytics solutionsMechatronic Engineer, Golden Arrow Bus Services, Cape Town AUGUST 2021 — JANUARY 2024  Contributed to the modernization and maintenance of electronic systems across the company’s fleet and workshops. Responsibilities included both hands-on technical work and project-based process improvement:   * Redesigned and upgraded legacy embedded systems by converting outdated assembly code to C, improving maintainability and performance. * Developed and modified electronic control systems, including PCB design and firmware programming (C/ASM). * Conducted fault-finding and installation support for GPS tracking units, destination display systems, geo-locking safes, and other in-bus electronics. * Reverse-engineered and documented legacy workshop machinery and automated equipment to improve training and maintenance workflows. * Participated in the enhancement of the bus wash system through mechanical and electronic modifications. * Carried out technical inspections of failed ECUs, assessed oil quality in fleet vehicles, and documented maintenance needs. * Supported the development of improved maintenance procedures and completed related administrative and compliance tasks  Intern, Veecraft Marine, Cape Town FEBRUARY 2021 — FEBRUARY 2021  Assisted in updating technical drawings and procurement of supplies. Further developed electrical CAD skills and applied this knowledge practically by wiring switchboards and installing electrical and electronic components on ships. Private Tutor, Self-employed, Stellenbosch JANUARY 2017 — DECEMBER 2020  Provided academic support for grade 10-12 Physical Sciences, Mathematics and first-year Applied Maths. Librarian (Administrative Officer), Stellenbosch University, Stellenbosch JANUARY 2020 — DECEMBER 2020  Assisted clients in using computer and library facilities and completed administrative tasks. Intern, Veecraft Marine, Cape Town JULY 2019 — JULY 2019  Learned about shipbuilding methods and shipyard standards from an engineering perspective as well as quality control procedures for shipbuilding. Student Mentor, Stellenbosch University, Stellenbosch JANUARY 2018 — DECEMBER 2024  Aided first-year students through their transition from high school to university by providing holistic support through a structured program. A blue square with white lines  AI-generated content may be incorrect.Education**Master of Engineering: Mechatronic Engineering, Stellenbosch University, Stellenbosch (In Progress)** JANUARY 2023 — PRESENT  This research investigates the impact of speckle pattern quality on the accuracy of Digital Image Correlation (DIC), a non-contact optical technique used to derive full field 2D and 3D displacement and strain measurements from sequential images of a deforming object. The reliability of DIC depends heavily on the characteristics of the random patterns applied to the surface of the structure being analysed.  The project focuses on:   * Critically evaluating existing quantitative metrics used to assess speckle pattern quality. * Investigating their limitations through an *anti-optimization* process to generate sub-optimal patterns and analyse metric behaviour. * Developing a Python-based software tool for speckle pattern generation and metric analysis. * Conducting physical experiments using DIC equipment in a controlled lab setting. * Establishing an objective validation method using analytical or FEM-based displacement fields as a ground truth for evaluating metric effectiveness.   The goal is to advance understanding of pattern evaluation techniques, identify gaps in current metrics, and contribute to improving the accuracy and robustness of DIC measurements in structural mechanics applications.  International Experience: Selected to participate in the *Blended Intensive Program: Materials Technology and Processes* at **Esslingen University of Applied Sciences**, Germany. Attended advanced lectures and hands-on lab workshops in materials engineering and manufacturing processes. Industry visits included Porsche AG and TRUMPF, offering exposure to cutting-edge applications in automotive and laser technologies. **Data Science Certificate: ExploreAI Academy, ALX** JULY 2024 — JUNE 2025  Completed a comprehensive year-long program covering core data science tools, techniques, and cloud platforms. Key competencies developed include:   * **Data Manipulation & Analysis**: SQL for querying databases, Python (pandas, numpy, matplotlib, scikit-learn) for data wrangling and analysis. * **Data Visualization**: Built interactive dashboards and reports using Power BI. * **Machine Learning**: Applied supervised (regression, classification) and unsupervised learning (clustering, dimensionality reduction) models. * **Natural Language Processing (NLP)**: Performed text preprocessing, sentiment analysis, and topic modelling. * **Cloud Computing**: Gained hands-on experience with AWS services for data storage and compute.  **Bachelor of Engineering: Mechatronic Engineering, Stellenbosch University, Stellenbosch** JANUARY 2017 — DECEMBER 2021  A multidisciplinary engineering degree combining mechanical, electrical, and computer systems. The program emphasized both theoretical foundations and practical problem-solving across a wide range of domains. Core modules included:   * Mechanical Engineering: Thermodynamics, Strength of Materials, Mechanical Design, Fluid Mechanics & Dynamics, Vibration and Noise. * Electrical & Electronic Engineering: Electro-techniques, Electronics, Electronic Design, Control Systems, Modelling of Dynamic Systems. * Mathematics & Computation: Engineering Mathematics, Applied Mathematics, Numerical Methods, Computer Programming & Systems.   Developed strong analytical and systems-thinking skills, with a focus on integrating hardware and software for real-world engineering solutions.  Final-Year Thesis - Fast Physical Optics Solver for Large Scale Electromagnetic Scattering Analysis: Developed a custom MATLAB-based solver to compute electromagnetic (EM) fields scattered from a Perfect Electric Conductor (PEC) when illuminated by an incident wave. The project applied advanced EM theory and physical optics principles to enable efficient large-scale simulation of scattering phenomena, focusing on algorithm optimization and mathematical modeling.  Committees:  Engineers Without Borders member.  Women Engineering Empowerment Committee member. **National Senior Certificate, Pretoria High School for Girls, Pretoria** JANUARY 2012 — DECEMBER 2016  Awards:  Matriculated with 6 distinctions.  Academic Full Colours: Maintained an average above 80%  Iris Award: Top 10 academic achievers  Service Half Colours: Administrated and implemented peer tutoring  Extra-curriculars:  UP with Science Programme – 3 Year Development Program with Science Faculty at University of Pretoria  Maths Olympiad training and participation at University of Pretoria |  | Details Cape Town, 7550, South Africa +27 84 687 7722  [vrishtisingh98@gmail.com](mailto:vrishtisingh98@gmail.com) Skills  |  |  | | --- | --- | | Communication | | |  |  |  |  |  | | --- | --- | | Teamwork and Leadership | | |  |  |  |  |  | | --- | --- | | Excel Proficiency | | |  |  |  |  |  | | --- | --- | | Detail-oriented | | |  |  |  |  |  | | --- | --- | | Programming: C; Matlab; R; Python and ASM | | |  |  |  Interests Data Science  Materials Engineering  Software Development  Literature and Philosophy Languages  |  |  | | --- | --- | | English - Proficient | | |  |  |  |  |  | | --- | --- | | Afrikaans - Advanced | | |  |  |  |  |  | | --- | --- | | French - Conversational | | |  | | Hindi - Beginner | | |  | |  | | |

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