

MALUNGELO LUZIPHO

Aeronautical Engineer | ANSYS Simulation Specialist

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🔗 <https://mluzipho.github.io/portfolio/>

PROFESSIONAL SUMMARY

Aeronautical Engineer with comprehensive expertise in Computational Fluid Dynamics (CFD) and Finite Element Analysis (FEA) grounded in first principles. Proven ability to deliver accurate and reliable numerical simulation results, working collaboratively with cross-functional teams to complete high-quality projects within strict timelines. Proficient in engineering design and simulation across various disciplines, including electronics cooling, electromagnetics (FDTD & MoM), thermo-mechanics, and structural engineering. Highly skilled in analyzing and optimizing complex systems using industry-standard CAD, CAE, and simulation tools.

CORE SKILLS

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|---------------|------------------------------|---------------------|
| ✓ MATLAB. | ✓ OpenFOAM. | ✓ Catia V5 & Creo. |
| ✓ Python. | ✓ ANSYS Fluent & Mechanical. | ✓ Nastran & Patran. |
| ✓ SolidWorks. | ✓ ANSYS Icepak & Maxwell. | ✓ AutoCAD. |

PROFESSIONAL EXPERIENCE

Senior Computational Simulation Engineer

Kutleng Engineering Technologies (Pvt) Ltd.

01/2022 – Present

Johannesburg, South Africa

Kutleng is an engineering consultancy firm in South Africa that specialises in Aerospace & Defence work, particularly; electronics, embedded firmware and software development, hardware design, software and hardware integration, and is an emerging global leader in telecommunication equipment design, certification, and associated services.

- Conducted extensive CFD analyses using ANSYS Fluent for diverse projects, focusing on developing numerical simulation models that accurately capture complex flow phenomena, including heat transfer, turbulence, viscous effects, buoyancy-driven flows, vorticity, and fluid conditions.
- Performed wind-loading CFD analyses on internal 5G NR parametric models mounted on radio towers at varying heights and terrains, comparing results across the k-omega, k-epsilon, and standard SST turbulence models.
- Conducted a 2D CFD simulation of a high-speed train traveling at Mach 0.2 through a tunnel to analyze sonic boom decibel levels and visualize the shock-wave propagation pattern from the tunnel exit.
- Optimized the wing-root fillet and payload bay of a surveillance UAV using the adjoint optimization method in ANSYS Fluent, followed by an aerodynamic analysis that resulted in a 9% reduction in overall drag and a ~5% improvement in the lift-to-drag ratio.
- Executed drop-test simulations using ANSYS Workbench LS-DYNA to analyze stress and strain points, structural integrity, and deformations at various angles and drop heights for electronic warfare and 5G electronic devices, reducing prototyping and experimentation costs by 70%.
- Conducted a numerical simulation using ANSYS HFSS to analyze the electromagnetic (EM) fields of various propagating modes and frequencies in waveguides for a naval radar communication system.
- Utilized parametric steady-state and transient thermal simulations to validate and optimize electronics cooling packages, incorporating copper heat pipes into heatsink enclosures without forced convection,

resulting in a 30% average improvement in thermal efficiency for passive cooling components within electronic devices.

- Streamlined the design of 80% of in-house CAD models for various projects by developing Python scripts in ANSYS SpaceClaim.
- Designed 5G NR heatsink enclosure CAD models that met internal thermal engineering specifications and were optimized for manufacturing via Aluminium Die Casting.
- Collaborated closely with electronic design engineers to ensure seamless integration of radio frequency (RF) and electrical components with mechanical/structural elements.
- Mentored junior engineers in developing and executing numerical simulation models.
- Designed CAD models of antenna baluns and array elements for electromagnetic simulations and beamforming analyses using ANSYS HFSS and performed topology optimization simulations using ANSYS Discovery to reduce weight in aluminum die-cast 5G NR heatsink enclosures.
- Developed Python scripts and C++ test bench scripts for an automated test framework as part of the **Eurofighter Typhoon Striker II Helmet** project in collaboration with **Hensoldt Optronics South Africa**, contributing to system verification. Reviewed SATPR and HATPR documentation to ensure compliance with acceptance criteria and utilized Git for version control and collaborative development.
- Prepared bills of materials (BOMs) for mechanical components across various projects, coordinating with local and international suppliers for components such as thread-forming screws, machine screws, and 3D printed and plastic injection-moulded parts. Ensured 100% on-time delivery while maintaining a 99% quality assurance rate.
- Conducted RF propagation and ray tracing simulations for 5G NR planning purposes using Wireless InSite after setting up realistic 3D virtual environments for local cities with their respective topographies and terrains.

EDUCATION

Undergraduate Studies

09/2017 – 06/2021

Nanjing University of Aeronautics & Astronautics

Nanjing, Jiangsu Province, China

BEng. Aeronautical Engineering

Thesis Topic: “Investigation on Aircraft Aerodynamics in Gusty Inflow Conditions.” – 85%

Postgraduate Studies

10/2023 – Present

Technical University of Madrid, Spain

(Distance Learning)

Master’s Degree (MSc.) in Numerical Simulations in Engineering with ANSYS – Expert’s Degree.

Modules:

- Fundamentals & Applications of Computational Fluid Dynamics (CFD).
- Heat Transfer.
- Multiphase Flows.
- Electromagnetism – Theory & Simulation.
- Fundamentals & Applications of the Finite Element Method (FEM/FEA).

ADDITIONAL SKILLS

Software Skills: C/C++ Programming, Microsoft Office (Incl. Excel & PowerPoint), Adobe Suite, Abaqus, Blender, Star-CCM+, GitHub, and SketchUp.

Technical Skills: Operation of CNC Milling & Lathe Testing Machinery, Lean Manufacturing, Numerical Simulation Troubleshooting, Aerodynamic Analysis (using RANS, URANS, & LES), and Engineering Workflow Development.

Languages: Conversational proficiency in Mandarin (中文) & Spanish.

References: Available upon request.