
ABOUT ME

- A curiosity about the fundamental natural forces driving the universe, and an inquisitiveness in harnessing these forces is what led to a career in engineering.
- Registered Professional Engineer in BC, Canada,
- 11+ years of skills, knowledge, and experience in the engineering industry, performing various design and management roles in the specification, conceptualisation, detail, manufacture, and testing of electric rotary actuators for robots, aerospace communications products, and offshore lifting appliances.
- Reliable intuition when it comes to figures of merit in mechanical & electromechanical engineering. Continuous development of mathematics and programming abilities.
- Embraces the power of automation in engineering development and competent at integrating software development with mechanical engineering design.
- Passionate about hands-on work, and experience building (and repairing) a broad range of machinery and equipment.
- Methodical approach to fresh challenges. Consideration for the bigger picture when performing a task, to maximise the efficiency and effectiveness of the work being performed.
- Relaxes by working on cars & motorbikes, hiking, mountaineering, scuba diving and gardening. Keen interests in mathematics, physics, finance, economics, and computer programming.

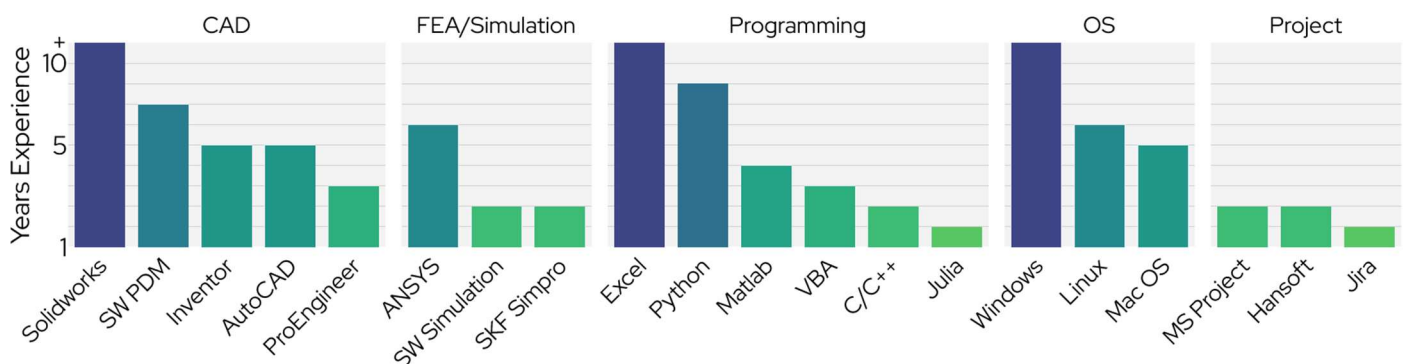
MAJOR SKILLS AND AREAS OF EXPERTISE

- Drives analysis towards the synthesis of solutions that meet product requirements. Confident application of mathematics in the design process, deriving solutions using first principles.
- Product development using FEA as an integral part of the design process.
- Rapid development of physical system models using Python.
- Subject matter expert in deep groove ball bearing selection and execution for rotating machines.
- Development of robust enclosures for electronics operating in extreme environments.
- Tenacious curiosity and drive to push the boundaries of my knowledge with new engineering challenges.

EDUCATION

- (2008 – 2013) M.Sc., Mechanical Engineering - The University of Cape Town
- (2004 – 2007) B.Sc., Electro-Mechanical Engineering (Honours) - The University of Cape Town

SOFTWARE EXPERIENCE



PROFESSIONAL EXPERIENCE

General Fusion (Vancouver BC, Canada)

Manager, Mechanical Engineering: September 2022 – present

www.generalfusion.com

- Engineering manager for compression systems, with 10 direct reports.
- SCRUM Master of the analysis, design and CAD teams.

Davidson Engineering (Vancouver BC, Canada)

Owner: July 2022 – present

www.davidson.engineering

- Engineering consultancy, providing elegant solutions to complex challenges.
- Specializing in robotics analysis & design, advanced bearing selection & execution and engineering software & calculators.

Genesis Motion Solutions (Vancouver BC, Canada)

Senior Electromechanical Design Engineer: July 2020 – August 2022 (2y)

www.genesismotion.com

- Technical mechanical expert on the electric machine design team, responsible for leading technical studies in multi-physics domains.
- Mechanical expert for the team producing customer evaluation units, responsible for delivering custom mechanical solutions for new customer requirements within a short timeframe.
- Subject matter expert for deep groove ball bearing selection and execution in actuator products.
- Developed a Python based tool which determined the torque requirements for the primary and theta axes of a Delta Robot. The software mapped pick and place operations into torque and speed profiles for each axis, by performing inverse dynamics using the virtual work principle. The software was able to batch process hundreds of load cases in just a few minutes, removing the need to use FEA for this type of study, and saved over \$200k in manhours.
- Prepared a lecture series titled: 'Bearing Selection and Execution Best Practices for Electric Rotary Actuators', summarizing my research on lubrication condition in deep groove ball bearings when used in oscillating applications.

Cobham Aerospace Communications (Cape Town, South Africa)

Senior Mechanical Engineer: September 2018 – June 2020 (1y 10m)

Mechanical Engineer: January 2016 – August 2018 (2y 8m)

www.cobhamaerospacecommunications.com

- Lead mechanical engineer for the development of one of the lightest satellite communication terminals in the world. The design utilised exotic materials and advanced additive manufacturing techniques to produce a working product which met the client's challenging specifications within a compressed deadline.
- Lead engineer responsible for the redesign, manufacture, testing and ongoing maintenance of several machines which automated the batch sorting of small diodes through measurement of their noise floor.
- Lead engineer for the design, manufacture, and commissioning of two large positioner systems for both an S-band and L-band anechoic chamber. The positioner systems were able to position a large ground plane with payload (~Ø2.4m and ≤50kg) with ≤0.1° precision.
- Lead engineer in the development, manufacture, and testing of a large footprint (1 x 0.4m) expander head for vibration qualification campaigns.
- Health and safety representative. Performed regular inspections to ensure development working areas were safe and promoted safe working practices.

Career Break

January 2015 – December 2015 (1y)

- Bicycled unsupported over 3,500km through Thailand, Laos, Vietnam and Cambodia.
- Drove a motorbike across South Africa and back again, sticking mostly to rural dirt roads.
- Project managed a renovation of my home.

Denith Engineering (Cape Town, South Africa)

Mechanical Engineer / Project Manager : July 2013 – December 2014 (1y 6m)

- Mechanical engineering designer and project manager for the design, manufacture and commissioning of a diver support workstation. The equipment was designed in accordance with DNV code 2.22 for lifting appliances. The workstation was delivered on time and within budget (~\$300k).
- Project manager and test engineer for the load testing of a specialized Davit system to facilitate the replacement of the flare tips on an oil rig. I planned all the activities to prepare the test site and equipment, assembly of the Davit, supervised and arranged for witness testing, and completed all documentation required for the client to certify the equipment.
- Completed a one-month apprenticeship with a highly skilled boiler maker, manufacturing large steelwork constructions of my own design.

IHC Marine and Mineral Projects (Cape Town, South Africa)

Junior Mechanical Engineer : January 2011 - June 2013 (2y 6m)

- Contract work for a UK based engineering company, designing a piggyback aligner chute system for a J-lay tower.
- I was responsible for the management of all Autodesk Inventor 3D solid models using Autodesk Vault (~2700 parts). I learnt is how to effectively manage large amounts of design data with a remote client.
- I was taught how to design large, complex steelwork fabrications, maximising stiffness while reducing material and fabrication costs.

The PC Doctor (Cape Town, South Africa)

Owner / Technician : September 2009 – December 2010 (1y 3m)

- Self employed part-time as a computer technician, repairing and upgrades PC's, data recovery, network administration and general tune ups of household computers.

INTERN EXPERIENCE

University of Cape Town (Cape Town, South Africa)

Student Lecturer : January 2008 - June 2010 (2y 6m) Part-time

- Prepared material, lectured and managed a practical for two modules as part of 'Engineering I' / MEC1004W. The class comprised of ~200 learners per year.

Marine and Mineral Projects (Cape Town, South Africa)

Student Engineer : November 2006 - Feb 2007 (4m)

- 2-month internship assisting in the SASA Crawler project, a mining tool for the diamond mining ship, the Peace in Africa. The crawler is a 240 tonne undersea tracked mining tool.
- Supervision of the manufacture and installation of control wire cable trays.
- Management of the earth switches procurement and assembly.

South African Breweries (Cape Town, South Africa)

Junior Technician: November 2005 - Feb 2006 (4m)

- 6-week internship in the electrical workshop of the South African Breweries packaging plant.
- Daily inspection of the bottling lines, performing calibration checks on the packaging machines.
- Response to machine malfunctions for repair and recalibration.

EDUCATION, DETAILED

(2008 – 2013) M.Sc., Mechanical Engineering - The University of Cape Town

- Dissertation Title: Myoelectric Triggered Dynamic Orthotic for Stroke Neurorehabilitation of the Index Finger.
- Areas of research: Robotics, Biomedical Engineering, Measurement & Control, Signal Processing.
- Elective: Engineering Software Design & Development (C++).

(2004 – 2007) B.Sc., Electro-Mechanical Engineering (Honours) - The University of Cape Town

- Major in Control Systems, Mechanical Design, Electrical Machines and Finite Element Analysis.
- SAIMEchE award for 'Best Undergraduate Thesis Project' with a result of 95%, 2007.
- Achieved a 74% GPA for 39 courses over 4 years.
- Deans Merit List Award, from 2004-2006.

(1999 – 2003) Senior Certificate - Cedar House High School, Cape Town

- Subjects: English (1st language), Afrikaans, Mathematics, Science, Art, Photography.
- Royal Society of Chemistry Award, UCT Science Fair, 2000.
- Silver medal, UCT Science Fair, 1999&2000.

CERTIFICATIONS

(2022 – Present) Registered Professional Engineer / P.Eng., British Columbia, Licence: 55784

(2011 – 2020) Recreational Scuba Diving | ±50 logged dives

- **Licence:** PADI Advanced Open Water Diver, **Specializations:** Enriched Air Diver, Deep Diver

ADDITIONAL COURSEWORK (MAJOR)

(2021.05 - 2022.03) Robotics Specialization - University of Pennsylvania via Coursera | ±120h

- Aerial Robotics, Computational Motion Planning, Mobility, Perception, Estimation & Learning, Capstone Project

(2020.02 - 2020.06) Modern Robotics - Northwestern University via Coursera | ±120h

- Foundations of Robot Motion, Robot Dynamics, Robot Motion Planning and Control, Robot Kinematics, Robot Manipulation and Wheeled Mobile Robots, Capstone Project, Mobile Manipulation

ADDITIONAL COURSEWORK (MINOR)

2023.01 – Simutech – CFD 101 with ANSYS Fluent

2023.01 – Atlassian - Jira Fundamentals

2022.04 – Coursera - Hands-on Introduction to Linux Commands and Shell Scripting - IBM

2022.03 - SKF - SimPro Expert - Bearing design software training

2021.06 - Coursera - Computers, Waves, Simulations: Practical Introduction to Numerical Methods w/Python- LMU

2021.05 - Coursera - An Intuitive Introduction to Probability - University of Zurich

2021.04 - Elgetti Engineering GmbH - Basics of Bearing Technology

2021.04 - Elgetti Engineering GmbH - Bearing Failures - Investigation and analysis of practical examples

2020.08 - Cadence MC - Seminar in Project Management

2020.06 - Coursera - Fundamentals of Reinforcement Learning - University of Alberta

2020.05 - Coursera - Machine Learning - Stanford Online