RUHAN LOUW

MECHATRONICS ENGINEERING STUDENT
FINAL YEAR

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PROFESSIONAL PROFILE SUMMARY

I am a student at the University of Stellenbosch, studying Mechatronics Engineering. As of the year 2022, I will be a final year student (4th year) and will be doing two major final year projects.

I have a passion for Robotics, Software Development, Electronics and Electrical Engineering. Hobbies include mechanical work (welding and metal work) integrated with microcontrollers and peripherals.

I have great interest in Bio-Medical Engineering, incorporating technology into prosthetics. I see myself doing this in the future.

ACQUIRED SKILLS AND STRENGTHS

CRITICAL THINKING AND DECISION MAKING– combined with my big picture focus, critical thinking and acute decision making, I prefer to look at innovative solutions to solve problems. I follow a diagnostic approach of looking at all the facts before identifying the issue, then consulting and collaborating with stakeholders before implementing sustainable solutions.

COMMUNICATION – I have learnt to deal with people at various levels in a professional manner, treating all with dignity, respect, and humility. I am diplomatic and have found that I am able to relate to people of various diversities. I am well known among my peers to be persuasive, have astute networking ability, with sound negotiation skills.

PROGRAM & PROJECT MANAGEMENT – In managing projects, organizational skills and teamwork are key, which involves working together towards the strategic objectives within timeframes and budget. I tend to adhere to this framework with clear, effective communication and planning in a collaborative setting.

STRATEGIC DIRECTION AND LEADERSHIP – Being highly driven and influential, I am passionate about efficiency in the designing space and able to provide strategic leadership and development for high performance and quality of outcome for the projects. I am equally passionate about professional development and ongoing learning, for myself and my teams. My track record reflects an enabler of organizational performance and sustainable positive change.

WORK ETHIC – I pride myself in respecting public laws and workplace rules and regulations and have always abided by my responsibilities. I can work accurately to meet deadlines without compromising the quality of work outputs. Coupled with my determination to succeed, I remain positive to achieve my outcomes even in the face of adversity. I commit to a cause and follow through to achieve my goals, being assertive when required to.

PERSONAL DETAILS

Full Name: Ruhan Louw

Known as: Ruhan

Nationality: South African

Current Location: East London, South Africa

Date of Birth: 07 December 1999

Languages: English and Afrikaans

EDUCATION AND PROFESSIONAL TRAINING

2022	**BEng Mechatronics Final** University of Stellenbosch Engineering 4th year *Passed all Modules up to date, some with distinction
2021	**BEng Mechatronics** University of Stellenbosch Engineering 3rd year
2020	**BEng Mechatronics** University of Stellenbosch Engineering 2nd year
2019	**Started BEng Mechatronics** University of Stellenbosch Engineering 1st year
2018	**Advanced Program Mathematics (AP Math)** IEB Curriculum
2018	**GRENS HIGH SCHOOL** East London *Graduated with 4 distinctions

CAREER TIMELINE

DATES	COMPANY	POSITION
Feb 2021	ZF Lemforder SA Pty Ltd	Vacation Work

ZF Lemforder is a company assembling the front and rear axials for the Mercedes C-class Plant in East London.
Working under the supervision of a qualified mechatronics engineer, I was tasked with the setup and integration of quality control cameras to detect faults on assembled parts. I gained experience with the Siemens Systems and the TIA portals.
I was further tasked with stock taking and gained knowledge on the production and assembling lines of a plant. Working under an industrial engineer, I learned the value of thorough planning while designing the axial assembly line for the new 2021 Mercedes C-class.
For my final task we repaired a 20t press responsible for fitting the bushings into the axial.

Dec 2019	Mechatronics Engineering Solutions (MES)	Vacation Work

At MES we were tasked with moving several robots from one plant to another. I gained some experience in Electrical work, connecting and disconnecting panels for the robots. I was also introduced to PLC programming and timing operations of the robots.

FAMILIAR SOFTWARE AND PROGRAMMING LANGUAGES

- 3D CAD Software
  - Autodesk & Autodesk Inventor
- Modelling and Simulations
  - MATLAB
  - Simulink
- Programming Languages
  - ARM Assembly, C, C#
  - Python, R, MATLAB

CONTACTABLE CHARACTER REFERENCES

- Mr. AJP Louw l Human Capital Consultant | Louwrandt Sole Prop l 082 451 8891
- Mr. Pierre Erasmus l Executive Director l Moov Fuel and Lubricants l 082 4252 022
- Mr. Kobie Pienaar l Ex-Managing Director l Vektronix (Pty) Ltd l 083 676 2161
- Further references listed under Projects, Assignments and Employment below

COMMUNITY INVOLVEMENT AND INTERESTS

- **OUMAN VICE CHAIR** – Functions and events manager for the Ouman Lounge in Helshoogtes Men's residence. Responsible for clothing. Also partakes in Ouman and House Committee projects.
- **HELSHOOGTE POLICY COMMITTEE** – Member of the Policy Committee responsible for drafting Visitors and Alcohol policies during Covid.
- **GEES EN LEWE CHURCH** – Helping the Church with food and delivery projects.
- **BEACH CLEANUPS** – Helping the church and other entities with cleanup projects of the Eastern and Western Cape beaches.
- **BORDER HUNTING CLUB** – Member of the Border Hunting Club and Organization.
- **HOBIES AND OTHER INTERESTS** – I enjoy the outdoors and in my free time will go out hunting, riding motorbikes (Enduro & Motocross), fishing or hiking.
  *I also enjoy software development and have a few games and apps currently in development.

MOST RECENT RELEVANT PROJECTS AND ASSIGNMENTS

SUBJECT: CONTROL SYSTEMS 3RD YEAR

PROJECT: HANDS FREE CAMERA SYSTEM FOR TENNIS

Tasks:

- ✓ Design a controller to control the orientation of the camera to follow a tennis player during a tennis match.

Methods and Procedures:

- ✓ Siemens PLC provided.
  - Used Siemens TIA portal
- ✓ Modeling of the electrical motor systems using MATLAB.
- ✓ Simulation testing in Simulink.
- ✓ Controller evaluation
  - PID
  - Compensator Controller (Lead & Lag)
- ✓ Conversions of equations.
  - Time domain
  - Frequency domain
  - Discrete time domain

SUBJECT: VIBRATION & NOISE 3RD YEAR

PROJECT: TUNED SPRING MASS DAMPED SYSTEMS

Tasks:

- ✓ Design a spring mass damped system to be used on machines under vibration.

Methods and Procedures:

- ✓ Derived the mechanical equations governing the motion of the machines.
- ✓ Transformed to the frequency domain and discrete time domain to take vibration measurements.
- ✓ Used Simulink to simulate the response of the systems.
- ✓ Used specialized software to take measurements and determine the resonant frequencies of the machine parts.

⇦ KEY ACCOMPLISHMENTS

- Favorite project to date.
- Incorporated the mechanical engineering aspects as well as the electrical engineering aspects.

MOST RECENT RELEVANT PROJECTS AND ASSIGNMENTS

SUBJECT: COMPUTER SYSTEMS 3RD YEAR

PROJECT: BRICK BREAKER GAME DEVELOPMENT

Tasks:

- ✓ Use an ARM CORTEX M4 microprocessor to develop and test the design of software.

Methods and Procedures:

- ✓ Programming language used
  - C
  - No functions libraries like Unity may be used, all software were to be designed by the student.
- ✓ Provided was an Emulator to test and debug software.
- ✓ Sprite allocation on Emulator screen.
- ✓ Incorporated the peripherals of the microcontroller board.
  - DAC systems
  - Communication between peripherals
  - SD card functionality etc.

SUBJECT: MACHINE DESIGN 3RD YEAR

PROJECT: BACKHOE MOUNTED ON A FLATBED VEHICLE

Tasks:

- ✓ Design a backhoe excavating arm.
- ✓ Backhoe placed on the back of a Corsa 1.4L bakkie.

Methods and Procedures:

- ✓ Standard Mechanical design procedures on Autodesk Inventor 3D CAD software.
- ✓ Used material science knowledge to choose the appropriate steels.
  - Used heat treated alloyed steels
- ✓ Geometry, fitment, and weight to be considered as the vehicle supplied is small.
- ✓ Choosing hydraulics actuators.
- ✓ Designing and compiling the Design Requirements and Manuals of operation.
- ✓ Worked in a team of 6 engineering students.

⇦ KEY ACCOMPLISHMENTS

- I lead a sub team of 3 engineering students.
- Proposed the design of the attachment rig to the bakkie.
- Tasked with the choice on hydraulics.
- Designed the operational and safety manual.
- In charge of the Boom design for the backhoe.

MOST RECENT RELEVANT PROJECTS AND ASSIGNMENTS

SUBJECT: FLUID & THERMODYNAMICS 2ND YEAR

PROJECT: DRAINNING A MINESHAFT

Tasks:

- ✓ Design a draining method for a mineshaft.
- ✓ Several sections to be drained.
- ✓ Considered Fluid and Thermodynamical properties.

Methods and Procedures:

- ✓ Conservation of energy and mass principals.
- ✓ Used head calculations to choose pumps.
    - Included calculations for pump blade design
    - Energy conservative design

SUBJECT: STRENGTHS OF MATERIALS 2ND YEAR

PROJECT: DEFLECTION OF A WIND TURBINE

Tasks:

- ✓ A 75m high wind turbine is subjected to various wind strengths.
- ✓ Had to design for materials that would support the load.
- ✓ Minimum deflection of the top end of the turbine.

Methods and Procedures:

- ✓ Used MATLAB for calculations and visualization.
    - Standard simulation procedures
    - Used MATLAB ode45 for deferential equations

⇦ KEY ACCOMPLISHMENTS

- Worked closely with Prof Tshamala at Stellenbosch University. He worked as a mechanical engineer at a mine for draining the water and by products.
- I lead a team of 4 engineering students.