



KYLE AHLSCHLAGER

ROBOTICS ENGINEER, MENG

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Education

MEng, Master of Engineering in Electronic Engineering

2022 - Present

Stellenbosch University

Western Cape, RSA

- **Research Topic:** Developing an autonomous robotic platform capable of navigation over unknown, rough terrain. A platform-fusion approach was used to ensure successful adaptability of the system. This research has resulted in two publications.
- **1st Publication:** "Using a multi-robot system for improved path planning", 2023 RAPDASA-RobMech-PRASA-AMI Conference. Presented under the topic of "Robotics and Mechatronics".
- **2nd Publication:** "Tethered Multi-Robot System for Improved Path Planning and Exploration", 2023 ICAR - *International Conference on Advanced Robotics*. IEEE accredited. Presented at conference during panel discussion, "Multi-Robot Systems".

BEng, Bachelor of Engineering in Electrical and Electronic Engineering

2018 - 2021

Stellenbosch University

Western Cape, RSA

- **Specialisation:** Robotics.
- **Final Year Research Topic:** using trajectory optimisation to control a walking biped. This involved the design and construction of the biped, the setup of a simulation environment to develop movement trajectories and the subsequent testing of these trajectories on the physical platform.
- **Distinctions Achieved:** Electro-techniques 143, Engineering mathematics 214, Electronics 365, Design (E) 344, Project management 412, Complementary Studies 441, Environmental engineering 442.

National Senior Certificate

2013 - 2017

Dale College Boys' High School

Eastern Cape, RSA

- **Honours:** Dux Scholar / Valedictorian with Distinction.
- **Awards:** Academic Full Colours, and Academic Honours 2015, 2016, 2017.
- **Leadership:** Student Council, school prefect in final year.
- **Subject prizes final year:** Mathematics, Physical Sciences, English Home Language, Afrikaans First Additional Language, Accounting, Life Sciences.

Technical Skills

Languages: English - native, Afrikaans - good, German - beginner, Dutch - beginner

Programming: C, C++, Embedded C, Python, LaTeX

Software: Fusion 360, Inventor, SolidWorks, Onshape, KiCAD, Linux, MATLAB, Simulink, OpenCV

Hardware: Arduino, STM32, Raspberry Pi, Jetson Nano

Fabrication: 3D printing - FDM and Resin, Machine tools, Sheet metal, PCB design

Experience

Freelance Electronics Consultant

2018 - Present

- Aided in interfacing an Arduino based PLC, as a 4th axis, into an existing 3-axis robot arm for a 4th year Mechatronics design project.
- Designed and installed a suitable control system, with accompanying motor and sensor for a particle separator. As part of a Mechanical Engineering thesis.
- Designed a control and logging system for a chemical waste treatment system. This was required to take pH readings from 3 separate sensors and utilising a PID controller adjust the amount of concentrate added to the system via a dosing pump. Additionally, the system was equipped with an optical sensor to measure CO₂ production, this data along with the dosing and pH readings was stored locally on a SD card and uploaded to an online dashboard for monitoring. This was part of a Masters of Engineering in Chemical Engineering thesis which achieved a cum laude in 2023.
- Provided input on the kinematic modelling, motor and driver selection, and controller design for a high-load, linear actuator driven quadrupedal robot.
- Designed a self-contained, battery powered alarm system for township shops. This system included both a siren and strobing LEDs for disorientation purposes, along with the control and charging circuitry.
- Designed a brass cartridge annealing system using an induction heated coil.
- Developed a livestock scale capable of both displaying and storing the measured "live-weight" of an animal.

Agricultural Machinery Diagnostician*2015 - Present*

- Diagnosed a faulty PTO control switch on a McCormick tractor. Subsequently, reverse-engineered and reproduced an improved version.
- Repaired a damaged wire harness on a Massey Ferguson 7600 series after it sustained burn damage.
- Various mechanical repairs to implements such as offset discs and rippers, including but not limited to replacing bearings and welding broken mounts.

Learning Assistant - Stellenbosch University*2022 - 2023*

- **Modules:** Electronics 315, Computer Systems 245, Control Systems 314
- Assisting students during tutorial and practical sessions with coursework and operating laboratory and experimental equipment.
- Assisting in the marking of formative assessments and practical reports.

Specialist Worker - Witchkrantz Farm*2015 - Present*

- Performing maintenance on tractors and other machinery.
- Installation and maintenance of a security system; CCTV, electric-fencing, access control.
- Installation and maintenance of a backup power system, solar inverter with Lithium-ion battery pack and backup generator.

Specialist Worker - Berlin Meats and Dairy*2015 - Present*

- Installation and maintenance of a security system; CCTV, access control.
- Installation and maintenance of a backup power system, solar inverter with Lithium-ion battery pack and backup generator.
- Maintenance and troubleshooting of POS system.
- Interacting with a diverse group of employees and customers.