JOY NJERU

Hindenburgstraße 81, Esslingen am Neckar
joy.njeru@outlook.com

SUMMARY

I am a motivated engineer with a strong foundation in sustainable mobility and automotive systems, specializing in energy efficiency and advanced modeling techniques. I hold a Master's degree in Automotive Systems and a Bachelor's degree in Mechanical Engineering. My internship experiences span diverse engineering sectors, including automotive manufacturing, quality assurance, and aircraft maintenance, providing me with a well-rounded perspective on engineering challenges and solutions. I am proficient in using tools such as MATLAB and Simulink for simulations and algorithm development, and I am committed to promoting sustainability and innovation within the engineering field.

SKILLS

- **Electric Drive System Design and Development:** Expertise in developing and optimizing electric drive components, including electric motors, inverters, and powertrain systems, ensuring performance, efficiency, and reliability in electric vehicles.
- **Model-Based Design and Simulation:** Advanced skills in **MATLAB/Simulink** for model-based design of electric drive systems, conducting Model-in-Loop (MIL) simulations, and validating vehicle systems for real-world performance.
- **Advanced Simulation and Data Analysis:** Proficient in **C/C++, MATLAB, Python**, and statistical tools for conducting advanced simulations, analyzing large datasets, and optimizing electric vehicle powertrain and control strategies.
- **Project Management and Execution**: Proficient in planning, executing, and overseeing complex engineering projects, including scope definition, risk assessment, resource management, and adherence to timelines for successful project delivery.
- **Quality Assurance and Functional Safety:** Knowledge in implementing quality control processes and ensuring **ISO 26262** compliance for functional safety in automotive systems, critical for high-performance and reliable electric drive units.
- **Sustainability and Clean Energy Technologies:** Strong understanding of sustainability principles and experience working with fuel cell systems, hybrid systems, and electric vehicles, aligning with the goal of emission-free driving.
- **Problem-Solving and Innovation in Electromobility:** Strong analytical skills in solving complex engineering problems related to electric drive and fuel cell systems, contributing to innovative solutions in the electromobility space.
- **Collaborative Leadership and Cross-Functional Teamwork:** Effective in collaborating with multidisciplinary teams, including software engineers, hardware specialists, and project managers, to develop cutting-edge electric drive technologies.

EDUCATION

Master of Engineering in Automotive Systems-Car Electronics

Hochschule **Esslingen** University of Applied Sciences
September 2020- February 2023

- **Thesis:** Model-based error analysis of PEM fuel cell under real-time conditions (Grade: 1.0)

Bachelor of Science in Mechanical Engineering-Automotive
Jomo Kenyatta University of Technology and Agriculture
September 2013- November 2018

- **Thesis:** Design and simulation of a hybrid suspension system for heavy-duty vehicles (Grade: 1.0)

EXPERIENCE

Master Thesis Student
Institute of Sustainable Energy, Technology and Mobility
September 2022- February 2023

- Led the development of a complex lumped-parameter model for PEM fuel cells, achieving less than 7% RMS error through advanced modeling and real-time data integration.
- Conducted Model-in-Loop (MIL) simulations and implemented a Particle Filter algorithm for real-time performance tracking.

Student Projects, Hochschule Esslingen, Germany
April 2021- June 2021

1. **Thermal Management Optimization for Hybrid Electric Vehicles**

   Analyzed and optimized vehicle thermal behavior using MATLAB/Simulink, improving energy efficiency and battery performance.

2. **Energy Consumption Analysis of Hybrid Powertrains**

   Evaluated hybrid powertrain efficiency using Sankey diagrams, recommending control strategies for optimal balance between combustion and electric systems.

3. **Field-Oriented Control of PMSM (Permanent Magnet Synchronous Motors)**

   Analyzed FOC algorithms in Simulink to enhance electric vehicle motor control.

4. **Parking Assist for Trucks**

   Developed a horizontal parking assist system integrating sensors, microcontrollers, and MATLAB, providing real-time vehicle orientation feedback.

Bachelor Thesis Student
Jomo Kenyatta University of Technology and Agriculture-Kenya
September 2017 – February 2018

- Designed a hybrid suspension system using CAD tools and validated it through Finite Element Analysis (FEA), improving vehicle handling and durability under heavy loads.
- Developed control algorithms using MATLAB to optimize suspension performance, reducing vibrations by settling time within 7 seconds.

Quality Assurance Intern, Body Fabrication Department
Associated Motors Limited -Kenya
August 2019 – December 2019

- Conducted visual inspections to ensure compliance with quality standards, enhancing overall product quality.
- Collaborated with engineers to improve manufacturing processes, contributing to effective communication and teamwork.

Manufacturing Engineering Intern
Kenafric Industries Limited - Kenya
June 2019 – July 2019

- Assisted in optimizing an automated production line through the application of Programmable Logic Controllers (PLC), enhancing system efficiency and reliability.

Aircraft Maintenance Intern
Air Kenya Express Limited-Kenya
July 2017 – September 2017

- Supported maintenance teams in various aircraft inspections and repairs, demonstrating attention to detail and adherence to regulatory standards.
- Assisted in the calibration and testing of avionics equipment, ensuring compliance with aviation regulations.
- Participated in ultrasonic testing and eddy current testing to identify potential defects in critical components.

Aircraft Maintenance Intern
Kenya Wildlife Service (Air Wing) – Kenya
May 2016 – August 2016

- Collaborated with technicians to conduct scheduled and unscheduled maintenance on a variety of aircraft.
- Supported engine maintenance procedures, including inspections and minor repairs, ensuring optimal aircraft performance.
- Maintained accurate maintenance records and assisted in compliance audits to align with regulatory requirements.

Manufacturing Engineering and Supply Chain Intern
Isuzu East Africa Limited, Kenya
August 2015 – October 2015

- Assisted in optimizing material identification and tagging systems, enhancing the efficiency of inventory management and production workflows.
- Collaborated with cross-functional teams to ensure timely availability of materials, reducing production bottlenecks and improving overall project delivery.
- Contributed to process improvement initiatives that enhanced material flow and supported the efficient execution of production schedules.

CERTIFICATIONS AND AWARDS

- **PLC and SCADA Certification Level 1** – Centurion systems, 2015 and 2016
- **Recognition Award for Outstanding Performance** – Rotary Club of Nairobi Thika Road, 2021

LANGUAGES

- English: Native
- German: Intermediate
- French: Familiarity

VOLUNTEER EXPERIENCE

Public Image Director
Rotary Club of Nairobi Thika Road – Kenya | *2020/2021*

- Led community outreach efforts, increasing the club's social media engagement by 25% and inducting 12 new members.
- Coordinated relief efforts during the COVID-19 pandemic, organizing donations for over 6,000 families and securing positive media coverage.