



Rahul Kumar

WORK EXPERIENCE

Intern

LUCCHI R. E-MOTOR SOLUTIONS, RIMINI, ITALY [15/04/2024 – 31/10/2024]

City: Rimini | Country: Italy

-Design of a test bench for experimental trials on a three-phase voltage impressed inverter based on wide-bandgap devices for the electromechanical energy conversion in new generation electric and hybrid vehicles

University teaching assistant

Sapienza University of Rome, Italy [07/11/2023 – 29/02/2024]

City: Rome | Country: Italy

-Assisting in Course work

Graduate Assistant

University of Technology PETRONAS [01/01/2019 – 21/05/2021]

City: Seri Iskandar | Country: Malaysia

- Partially teach Engineering Students
- Handles Labs
- Handles exams and assignments
- invigilation duties

Design and Site Engineer

YH Associates and Consultants [01/02/2018 – 30/12/2018]

City: Karachi | Country: Pakistan

-Worked on designing of HVAC systems
-Handled site allotted by company

Lab Engineer (Intern)

NED University Karachi Pakistan [01/02/2017 – 30/01/2018]

City: Karachi | Country: Pakistan

-Handles Lab
-Organising courses and workshops

Intern

GUDU Power Plant Sindh Pakistan [01/07/2014 – 30/07/2014]

City: GUDU, Sindh | Country: Pakistan

- Observed and documented daily operations within the power plant, gaining foundational knowledge of power generation and distribution processes.

-Supported routine maintenance and system checks, learning practical applications of theoretical engineering principles.

EDUCATION AND TRAINING

PHD

Sapienza University of Rome, Italy [01/01/2022 – Current]

City: Rome | Country: Italy

Received PON scholarship

- Majored in Power Electronics
- Dissertation: Wide-Bandgap-Semiconductor-Based, Three-Phase Voltage Source Inverter for High Frequency Electromechanical Energy Conversion in Next Generation Hybrid Electrical Vehicles

PROJECT SUMMARY

The Ph.D. project involves the development of a high-efficiency, water-cooled 50 kVA GaN-based three-phase inverter for electric vehicle applications. The work encompasses comprehensive inverter design, device selection, loss analysis, and thermal management using liquid cooling. Simulations were conducted in PLECS, switching loss analysis performed in LTspice, and parasitic evaluations carried out using Q3D Extractor, with power and driver boards designed in Altium. Currently awaiting experimental analysis, this research advances power electronics by utilizing the superior properties of GaN devices.

Msc in Electrical and Electronics Engineering

University of Technology, PETRONAS [01/01/2019 – 28/05/2021]

City: Seri Iskandar | Country: Malaysia

- Received Graduate Assistantship
- Majored in Power Electronics
- Dissertation: A Design and Development of High Step-up Switched Z-source Converter with Minimal Components Count.

KEY COURSES AT MSC LEVEL: Research Methodology, Bi-annual postgraduate symposium (BAPC).

TEACHING EXPERIENCE: Conducting Tutorials and Labs for subjects such as Power Electronics, Advanced Power Electronics, Power Systems, Electrical Machines, and Advanced Power Systems, etc.

PROJECT SUMMARY:

Experimentally verified the newly developed design of the Z-source DC-DC converter which obtained the higher voltage gain at the reduced duty cycle, while utilizing minimal components count. Three different circuits were developed in this project. First, the NE555 timer circuit for generating the gate signal. Secondly, the MOSFET driver circuit to drive the switches, and at the last, the proposed circuit was developed on the breadboard. The obtained results matched well with simulation and theoretical results which justify the performance of the developed design.

BE in Electrical Engineering

QUEST Nawabshah Sindh Pakistan [14/01/2013 – 30/12/2016]

City: Nawabshah | Country: Pakistan

KEY COURSES AT UNDERGRADUATE LEVEL: Electronic devices and circuits, Basic Electrical Engineering, Instrumentation, Communication skills, Electromagnetic field theory, Network Analysis, Power Electronics, Power Generation, Power Transmission, Power Distribution, Electrical Machines (DC), AC Machines, Power System Economics, Digital Electronics, etc.

PROJECTS AT UNDERGRADUATE LEVEL:

- Energy crises and its technical solutions in Pakistan: (Final Year Project at Undergraduate)
- Development of DC motor.
- Case Study of 132 kV grid station Larkana, Sindh, Pakistan.
- Designing DC-DC converter using Simulink and implementing experimental setup.

PHD School

University of Cassino [22/05/2023 – 26/05/2023]

City: Gaeeta | Country: Italy

Title: Power Electronics, Electrical Machines, Energy Control and Power Systems

DIGITAL SKILLS

Softwares

Plexim-PLECS / Altium Designer (Good) / Circuit design and simulation: LTspice / PSIM medium level / MATLAB Matlab Simulink / Origin software (data processing and analysis) / Ansys Q3D

Equipment Expertise

oscilloscope / LabVolt / Function Generator

CERTIFICATIONS

Research Methodology from UTP Malaysia

Introduction to PSIM Webinar

IELTS (6.5 bands)

Certificate for completion of Latex Workshop

Certificate of Appreciation for organizing course “Certified Procurement Professional”

Certificate of Appreciation for organizing meeting of “Professionals HR” throughout Pakistan.

Certificate of completion for the “Introduction to PSIM”webinar.

PUBLICATIONS

[2020]

A High Gain Switched Z-Source Converter with Reduced Passive Components

Rahul Kumar, Ramani Kannan, Nursyarizal Bin Mohd Nor

[2021]

A High Step-Up Switched Z-Source Converter (HS-SZC) with Minimal Components Count for Enhancing Voltage Gain

Rahul Kumar, Ramani Kannan, Nursyarizal Bin Mohd Nor, Electronics

[2022]

An Efficient Design of High Step-Up Switched Z-Source (HS-SZSC) DC-DC Converter for Grid-Connected Inverters

Kumar, R.; Kannan, R.; Singh, N.S.S.; Abro, G.E.M.; Mathur, N.; Baba (Electronics)

[2020]

Maximum Power Point Tracking Using Perturb & Observe Algorithm For Hybrid Energy Generation”, “Journal of Independent Studies and Research Computing

Write here the description...

Ghulam E Mustafa Abro, Gulbadin Khan Kakar, Rahul Kumar

[2021]

Piece-wise Linear Fuzzy Sliding Mode Controller for Deep Submergence Rescue Vehicle (DSRV)

Saba Javed, Ghulam E Mustafa Ab, Rahul Kumar (Sir Syed University Research Journal)

[2020]

Prototyping Pro- active Wearable Gadget for the Surveillance of Coal Miners in Pakistan” International Virtual Conference on Artificial Intelligence for Smart Community 2020, (IVC-AISC 2020)

Rahul Kumar, Ramani Kannan, Jayasankari Ganasan, Ghulam E Mustafa Abro

[2020]

An Enhanced Voltage gain switched Z-source Converter with Minimal Components

Rahul Kumar, Ramani Kannan*, Nursyarizal Bin Mohd Nor (ESTCON)

[2020]

Design of a self-tuning PID controller for a temperature control system using Fuzzy Logic

Md. Tauhidul Islam, Ariful Islam, Rahul Kumar, Ghulam E Mustafa Abro

[2021]

Hybrid Control Design for Improvising the Performance of Multi-tap Variable Shunt Reactors

Ghulam E Mustafa Ab, Rahul Kumar*, Zuhaina Zakaria, Suresh Kumar

[2021]

Dynamic Modeling of COVID-19 with an Impact of Lockdown in Pakistan and Malaysia 2021

Ghulam E Mustafa Abro, Maheshwari R, Rahul Kumar

[2021]

Modeling, Controlling & Stabilization of Underactuated Air-Cushion Vehicle (Acv)

Ghulam E Mustafa Abro, Maheshwari R, Rahul Kumar* Saba Javed

HONOURS AND AWARDS

[01/01/2019] University of Technology PETRONAS

Award of Graduate Assistantship (GA) full scholarship offered by one of the leading research institutes in the world UTP Malaysia.

[01/01/2022] Sapienza University of Rome

PON scholarship for PHD

PROFESSIONAL AFFILIATION

Pakistan Engineering Council (PEC)

RECOMMENDATIONS
