RAHUL RAJ R

☎ +91-8778582600 ◇ ✉ rhlrj.wp@gmail.com ◇ in LinkedIn

OBJECTIVE

Passionate Electrical Engineering undergrad seeking research-focused internship. Strong academic foundation, enthusiasm for problem-solving, and interest in emerging technologies. Eager to learn from experienced professionals, contribute to projects, and gain practical skills. Committed to advancing electrical engineering through hands-on experience and collaborative research.

EDUCATION

Bachelor of Technology in Electrical Engineering   2022 - 2026
Vellore Institute of Technology, Chennai Campus, Tamil Nadu, CGPA : 8/10

My coursework covers a wide range of subjects including Electrical Circuits, Power Systems, Electrical Machines, Control Systems, and Power Electronics, Digital Electronics, Analog Circuits, Microprocessors, and Microcontrollers, Communication Systems, Signals and Systems, and Electromagnetic Field Theory, Industrial Automation, Renewable Energy Systems, Robotics, and Machine Learning for Electrical Systems.

Maharishi International Residential School, CBSE, Class XII   2020 - 2022
Sriperumbdur, Chennai, Tamil Nadu, 80%

Dr.G.S.K memorial school, CBSE, Class X   2013 - 2020
Kumbakonam, Tamil Nadu, 93%

SKILLS

Programming	Python, C, Java, MySQL, Rstudio
Circuit Design	LTspice, PSpice, EasyEDA
Modeling	MATLAB, PSCAD
CAD	AutoCAD, Onshape
Media Production	DaVinci Resolve, GIMP, Audacity, Blender
Hardware	ESP32, Arduino, FLuke 437 meter, PCB, ICs
Language	English, Tamil, German(A2)

PROJECTS

Vibrational analysis using Seismo sensor with Arduino
Minor Project

· Built a vibration monitoring system using Arduino and Seismo sensor.
· Collected and analyzed real-time vibration data for pattern detection.
· Implemented signal filtering and threshold-based anomaly alerts.
· Visualized data using serial plotter and external tools for interpretation.

Comparative Study of Working model of Pumped Storage Hydropower System using MATLAB and Simulink
Minor project

· Simulated a Pumped Storage Hydropower system model to demonstrate energy storage.
· Developed control logic and working demonstration using both MatLAB and Simulink as seperate models
· Analyzed system performance under different load conditions and operational cycles.
· Focused on energy efficiency, flow rate dynamics, and real-time system behavior.

Implementation of V/F Controlled Variable Speed Induction Motor Drive
Minor project

- Designed and implemented a V/F control strategy using a FPGA.
- Developed hardware interface between the microcontroller and inverter for variable speed operation.
- Conducted real-time testing, optimizing control parameters for efficient motor performance.
- Analyzed motor behavior under different speed and load conditions, ensuring smooth operation.

Performance Analysis of a Transformer using Python
Minor project

- Developed a Python script to evaluate transformer efficiency and voltage regulation under six load conditions.
- Used primary/secondary voltage, current, and power parameters to calculate performance metrics.
- Plotted efficiency and voltage regulation graphs using Matplotlib for visual analysis.
- Provided a flexible framework to analyze different transformer models and load scenarios.

Performance Analysis of a Transformer using Python
Minor project

- Developed a real-time air quality monitoring system using ESP32 with sensors like MQ135 and DHT11.
- Collected data on air pollutants, temperature, and humidity, and transmitted it wirelessly for remote access.
- Integrated historical data analysis using AI to predict air quality trends and detect anomalies.
- Visualized live and past data through interactive dashboards, enhancing environmental awareness and decision-making.

Comparative Study on Reactive Power Limits using MATLAB
Minor project

- Simulated dynamic reactive power limits to assess system behavior.
- Applied the **Gauss-Seidel method** for load flow analysis.
- Compared actual reactive power demand with the generator's thermal-based Q capability.
- Visualized Q limits and demand through plots for system performance evaluation.

QPSK Transceiver Simulation and Performance Analysis using Simulink
Minor project

- Developed a QPSK transceiver model using **Simulink** to simulate digital communication systems.
- Implemented modulation and demodulation techniques for effective signal transmission and reception.
- Analyzed system performance in various noise conditions, including error rates and signal-to-noise ratios (SNR).
- Evaluated the impact of different modulation parameters on system reliability and efficiency.

Self-Balancing Robot using ESP32
Club project

- Contributed as an electrical member in a large team to develop a self-balancing robot using **ESP32**.
- Responsible for selecting key components for the robot, ensuring compatibility and performance.
- Handled PCB connections, ensuring proper integration and functionality of electrical components.

Vibrational MEMS-based Sensor using PVDF
Minor Project *On-going*

- Designed a vibrational MEMS-based sensor utilizing **piezoelectric** properties of **PVDF** material for vibration detection.
- Conducted theoretical calculations to optimize the sensor's performance in terms of sensitivity and frequency response.
- Created a detailed **CAD design** for the sensor, ensuring accurate dimensions and integration of piezoelectric elements.
- Analyzed potential applications for the sensor in various fields, including industrial monitoring and structural health assessment.

Smart Hydration Tracker using Miniature Weighing Coaster
Minor project   *On-going*

· Designed a compact hydration tracking device using a miniature weight-sensing coaster powered by an **ESP32-C3** microcontroller.
· Modeled a custom enclosure using **CAD software** to ensure ergonomic fit and sensor integration.
· Integrated an **FSR sensor** to measure real-time bottle weight and calculate water intake throughout the day.
· Implemented **Wi-Fi connectivity** to transmit data to a mobile application and cloud database for remote tracking and analysis.
· Developed an AI-based system to analyze hydration patterns using **BMI, weather, and humidity data**, triggering personalized reminders.
· Enabled user-friendly visualizations and notifications through a mobile interface for effective hydration management.
· Currently planning an enhanced version with improved accuracy, better form factor, and additional smart features.

EXPERIENCES

Nanotechnology Research Intern   Nov 2022 - Dec 2022
Teachnook   *Remote*

· Engaged in major team projects and individual assignments, designing cutting-edge nanomaterials and exploring their applications. Conducted independent research, experiments, and data analysis, while receiving in-house training to bridge theory with practice. Enhanced technical skills, teamwork abilities, and a strong passion for contributing to nanotechnology advancements.

Power Quality Auditing & Standards Analyst   Nov 2023 - Dec 2023
ICD Power Solution PVT Limited   *On-Site*

· As a Power Quality Auditor, I studied and presented on IEEE and GRI standards, ensuring compliance with industry regulations. I documented findings from the audits and provided recommendations for solutions based on the data collected from the site. Additionally,I also explored the fundamentals of digital marketing to enhance outreach and communication strategies.

Team Lead – Industrial Energy Audits   Dec 2023 – Mar 2024
India 4.0 Technologies   *On-Site & Remote*

· An ndustry 4.0 based startup, focusing on power quality, Where I Led teams and coordinated tasks while working with a power quality auditor at a startup. Personally retrieved data from **Fluke 437 - 11 Power Quality meter** devices, documented the findings, and provided tailored audit recommendations for factories. Contributed to a government-funded project that secured a tender from the **Indian government** for auditing major power stations and railways across India. Managed critical documentation for the tender process before transitioning out due to academic commitments.