Shenal Ranasinghe

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*"Undergraduate @UOM ENTC — RF and Microwave — Embedded Systems — Electronics — Antennas — To Ignite
Creativity for Transformative Impact"*

EDUCATION

University of Moratuwa, Sri Lanka	May 2022 - Present
B.Sc. (Hons) in Electronic and Telecommunication Engineering	***CGPA: 3.63/4.0***

Dean's List: Semester 4, 6

Relevant Coursework: *Electromagnetics, Digital Signal Processing, Analog Circuit Design, Wireless and Mobile Communications, Embedded Systems and Applications, Communication Systems Engineering, Electronic Circuit Design, Internet of Things, Data Structures and Algorithms, Introduction to Engineering Optimization*

St. Joseph's College, Colombo 10	Jan 2010 - Dec 2020

G.C.E. Advanced Level Examination 2020 (Physical Science Stream)
  Physics (A), Chemistry (A), Combined Mathematics (B) - Z-Score: 2.1064
G.C.E. Ordinary Level Examination - 9As

WORK EXPERIENCE

Sentranova (Pvt) Ltd	Mar 2025 - Sep 2025

Part-Time Electronic Engineer

- **IoT Smart Soap Dispenser**: Developed firmware for the dispenser using a Quectel EG9-series 4G module, enabling GPS location retrieval, HTTPS-based API communication with custom SSL/TLS handling, and reliable data exchange between the hardware and cloud services while strengthening embedded IoT integration expertise.

Paraqum Technologies (Pvt) Ltd	Dec 2024 - June 2025

Embedded Systems Engineering Intern

- **Audio Matrix Motherboard**: Redeveloped existing DOTA card to Type C configuration and combined three separately developed PCBs (two 4-layer and one 6-layer) into a single unit per customer request.
- **Trident GPS Tracking System**: Developed complete GPS tracking system for refrigerator monitoring including temperature sensing, on/off time tracking, and location monitoring. Designed circuit, PCB, and project documentation.
- **Keyfob Remote Controller**: Developed HAL libraries for RNG90 and PCF8563 ICs and verified existing library for remote key and controller system.

SKILLS

Electronic Circuit Design	*LTspice, Keysight ADS, QUCS, Ansys Circuits*
IC Design	*Xschem, Klayout, Sky130 PDK, IHP PDK*
Programming	*C/C++, Python, MATLAB, Bash Scripting, LaTeX*
EM Simulation	*Ansys HFSS, openEMS (IC Inductor Design)*
Antenna Design & Simulation	*Ansys HFSS, Ansys Circuits, FEKO, Altium*
PCB Design	*Altium, SIwave (Signal Integrity)*
Firmware Development	*STM32 (HAL/LL), Arduino, ESP-IDF*
HDL	*SystemVerilog, VHDL*

PROJECTS

GPS L1 Receiver System with Spoofing Detection Capability (FYP) | *RF Design, SDR, ML*	Jun 2025 - Present

- Final-year project on GNSS spoofing detection using custom RF front end, SDR-based DSP chain, and machine learning.
- **Documentation:** Project Link

UHF RFID Reader Gate for Warehouse Management | *RF Design, Altium, HFSS*	Feb 2024 - Aug 2024

- UHF RFID reader gate with custom RF front end, antenna design, and multi-layer PCB integration.
- **Documentation:** Project Link
- **GitHub:** Repository

Dual-Sense Circularly Polarized Antenna for GPS L1 | *HFSS, Antenna Design* In Progress
- Two-layer slotted circular patch antenna with orthogonal slots enabling RHCP/LHCP operation at 1575.42 MHz.
- **Documentation:** [Project Link]

Transformer Thermal Anomaly Detection System | *React, Java Spring, AI* Aug 2025 - Dec 2025
- Web-based system for automated transformer thermal inspection using AI-based anomaly detection.
- **Documentation:** [Project Link]

Coax-Fed Microstrip Patch Antenna (5.8GHz) | *HFSS, Antenna Design* June 2024
- Designed and fabricated a coax-fed microstrip patch antenna for 5.8 GHz applications with impedance matching and radiation pattern optimization.
- **Documentation:** [Project Link]

UART Implementation on FPGA | *SystemVerilog, FPGA* May 2024
- UART transceiver designed and verified on FPGA using SystemVerilog.
- **Documentation:** [Project Link]

IoT-Based Smart Medication Management System (Medibox) | *ESP32, IoT, MQTT* Jan 2024 - May 2024
- ESP32-based IoT system for medication scheduling, environmental monitoring, and cloud integration.
- **Documentation:** [Project Link]

Guitar Headphone Amplifier | *Analog Electronics, Altium* Sept 2023 - Nov 2023
- Analog headphone amplifier with selectable gain stages designed using discrete components.
- **Documentation:** [Project Link]
- **GitHub:** [Repository]

IoT-Based Home Security System | *IoT, ESP32, PCB Design* May 2023 - Aug 2023
- Low-cost IoT home security system with custom PCB design and sensor integration.
- **Documentation:** [Project Link]
- **GitHub:** [Repository]

P2P Communication System using SDR (GNU Radio) | *SDR, GNU Radio* Sept 2023 - Nov 2023
- Secure peer-to-peer SDR-based communication system supporting text, image, and audio transmission.
- **Documentation:** [Project Link]

Personal Engineering Portfolio Website | *Web Development* 2024
- Personal technical portfolio for documenting RF, embedded, and system-level engineering projects.
- **Documentation:** [Project Link]
- **GitHub:** [Repository]

SPECIALIZATIONS & CERTIFICATIONS

RF and millimeter-Wave Circuit Design | *RF, mmWave* June 2024 - Oct 2024
- Master-level microcredential (5 EC) covering RF wireless system specifications and transceiver design. Comprehensive study of key building blocks including low noise amplifiers (LNA), power amplifiers (PA), RF mixers, oscillators, and PLL frequency synthesizers. Combined theoretical foundations with hands-on design labs involving circuit simulation and implementation for future wireless communication systems operating at high frequencies with active phased-array antenna technology.
- Eindhoven University of Technology - Coursera
  [Certificate]

Microwave Engineering and Antennas | *Microwave, Antennas* June 2024 - April 2025
- Master-level course (5 ECTS) completed over 11 months while pursuing undergraduate degree, driven by passion for RF engineering. Comprehensive 9-module program covering passive microwave circuits (transmission lines, impedance matching, power combiners, filters), antenna theory and phased arrays, and active microwave circuits including low-noise amplifiers. Completed design challenge involving the complete design of an active phased array system with antennas, beamformers, and amplifiers. Focused on co-design of highly integrated antenna systems for mmWave 5G/beyond-5G wireless communications and automotive radar applications.
- Eindhoven University of Technology - Coursera
  [Certificate]

RF Filter Design Fundamentals using Keysight ADS | *RF Design, ADS* Oct 2025 - Nov 2025
- Completed out of passion to understand distributed element filter design principles. Covered lumped and distributed element filters, lowpass, highpass, bandpass, and bandstop filter synthesis, impedance and admittance transformations, and practical implementation using Keysight ADS for RF and microwave applications.
- Rahsoft - Udemy
  [Certificate]

FPGA Design for Embedded Systems Specialization (3 of 4 courses completed) | *FPGA, HDL* Oct 2025 - Present
- Ongoing 4-course specialization pursued to strengthen FPGA skills for complete RF system design. Covers FPGA architecture, HDL programming (VHDL/Verilog), digital design principles, softcore processors, IP core integration, and hardware-software co-design for embedded systems. Completed courses include: Introduction to FPGA Design, Hardware Description Languages, and FPGA Softcore Processors and IP Acquisition.
- University of Colorado Boulder - Coursera
  Course 1: Certificate Course 2: Certificate Course 3: Certificate

Altium Education PCB Basic Design Course | *PCB Design*   March 2025
- Altium

Economics - Certificate Level | *Economics*   November 2023
- CIMA

HONOURS AND ACHIEVEMENTS

2nd Best Project - Electronic Design Realization Module   2023
- Selected as the 2nd best project at the department for the 4th semester project

Gold Medal - School Physics Examinations, Sri Lanka   2019
- Awarded Gold Medal in School Physics Examinations

Under 15 All Island Squash Novices Championship   2015
- Secured 1st Place

Under 19 All Island Squash Team Championship   2015
- Achieved 4th Place

LEADERSHIP AND EXTRA-CURRICULAR ACTIVITIES

IEEE MTT-S Student Branch Chairman   Sept 2025 - Present
- Led RF/microwave-focused workshops, organized industry speaker sessions, and mentored juniors on practical RF design.

EXMO Telecom Lab Coordinator
- Volunteered as Telecom lab coordinator, presenting on PSTN networks and mobile phone operations.

Personal Trainer   2023 - Present
- Coach strength and conditioning programs at the gym, supporting peers in meeting performance goals.

Advanced Level Physics Tutor   2021 - Present
- Deliver weekly A/L Physics tuition sessions for high-school students; teaching experience of 4+ years.

University Weightlifting Team   2022 - Present
- Active member

Squash Captain   2020
- Appointed as Squash Captain for School Team

REFERENCES

Dr. Chamira U. S. Edussooriya
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