

# Shenal Ranasinghe

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"Undergraduate @UOM ENTCT — 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: 3.67/4.0

Dean's List: Semester 4, 6, 7

**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

### 3D Modeling & Printing

SolidWorks, Ultimaker Cura, Creality Print

## PROJECTS

### GPS L1 Receiver System with Spoofing Detection (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.
- **Related Research:** Group project on NEMESIS (Neural Embeddings for Modern Electronic-warfare Spoofing Identification System) applying ML techniques to electronic warfare scenarios. Details will be shared upon publication.

- **Documentation:** [Project Link](#)

### 2.4GHz Type-II $\Delta\Sigma$ Fractional-N PLL for Bluetooth | RFIC Design, SKY130 PDK

May 2025 - Present

- Group project designing a complete fractional-N phase-locked loop using open-source SKY130 PDK. Responsible for RF inductor design workflow including EM simulation using openEMS, layout optimization, and integration with synthesizer architecture for Bluetooth applications.
- Details will be shared upon publication.

#### 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* Jun 2025 - Dec 2025

- 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* Oct 2024 - Present

- Personal technical portfolio for documenting RF, embedded, and system-level engineering projects; developed with AI-assisted workflow while maintaining original design concepts and styling decisions.
- **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 transceiver building blocks: LNA, PA, mixers, oscillators, and PLL synthesizers. Hands-on circuit simulation and design labs for high-frequency wireless systems with 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) covering passive microwave circuits, antenna theory, phased arrays, and active circuits. Completed design challenge for complete active phased array system including antennas, beamformers, and amplifiers for mmWave 5G and automotive radar applications.
- Eindhoven University of Technology - Coursera [Certificate](#)

- Covered lumped and distributed element filter design, synthesis techniques for lowpass/highpass/bandpass/bandstop filters, and practical implementation using Keysight ADS.

- Rahsoft - Udemmy

[Certificate](#)

**FPGA Design for Embedded Systems Specialization (3 of 4 courses completed)** | *FPGA, HDL* Oct 2025 - Present

- FPGA architecture, HDL programming (VHDL/Verilog), softcore processors, IP core integration, and hardware-software co-design. Completed: Introduction to FPGA Design, Hardware Description Languages, and FPGA Softcore Processors.

- 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**


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**UNIC CASS Tapeout 2026 Selection**

2025

- Selected for UNIC CASS (Circuits And Systems Society) Tapeout 2026 program; actively working on RFIC design for fabrication.

**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**


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**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**


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**Dr. Chamira U. S. Edussooriya**

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