

# Vijithan Kurrshanth

ELECTRONIC & TELECOMMUNICATION ENGINEERING UNDERGRADUATE

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“Start Where You Are. Use What You Have. Do What You Can.”

## Objective

Seeking challenging opportunities to contribute to solving real-world problems using state-of-the-art technologies, where my skills, education and experience can be fully utilized and enhanced.

## Education

### University of Moratuwa

Katubedda, Sri Lanka

B.Sc. ENG. (HONS) IN ELECTRONIC AND TELECOMMUNICATION ENGINEERING

Aug. 2021 - PRESENT

- **GPA** :3.855/4.0 (as of the end of semester 6)
- **Relevant Coursework** : Software Design Competition (A), Data Structures and Algorithms (A+), Wireless Networks (A), Internet of Things (A+), Communication Network Engineering (A+), Communication Systems Engineering (A+), Communication Design Project (A+), Industrial Electronics and Automation (A+)
- **Other Courses** : Business Economics and Financial Accounting (B+), Industrial Management and Marketing (B+), Operational Research (A+)
- **Dean's list** : Made it to the dean's list in semesters 1,2,4 and 6

### BT/KK/Valaichenai Hindu College

Valaichenai, Sri Lanka

G.C.E ADVANCED LEVEL

2017 - Aug. 2019

- **Results** : 3A (Combined Mathematics, Physics, Chemistry)
- **Island Rank** : 123
- **District Rank** : 1
- **Z-score** : 2.6121

## Skills

<b>Programming</b>	Python, C++, C#, JAVA, JavaScript, TypeScript
<b>Web</b>	SpringBoot, Flask, REST API, Angular, React
<b>Tools</b>	Git, Docker, Kubernetes, MySQL, MongoDB, Unity, Node-Red, MATLAB, GNURadio, Wireshark, Arduino, Altium, SolidWorks
<b>Operating Systems</b>	Windows, Linux
<b>Languages</b>	English, Tamil, Sinhala (Speaking, Reading, Writing)

## Industry Experience

### Axiata Digital Labs (Pvt) Ltd

Colombo, Sri Lanka

SOFTWARE ENGINEERING INTERN

Nov. 2023 - May. 2024

- **Tech Stack** : OpenAirInterface5G, Docker, Kubernetes, Axonect Enterprise Enabler, MySQL, MongoDB, Springboot, Angular, REST API
- Worked on a collaborative open source 5G orchestration project with ADL, Dialog and UoM as stakeholders.
- Local deployment of a fully functional 5G core and RAN using SDRs and 5G user equipment (NRUE).
- Local Kubernetes deployment of 5G core using minikube and connecting RAN with 5G core deployed in the local Kubernetes cluster.
- Cloud-based 5G core deployment in Kubernetes environment using Axonect Enterprise Enabler platform.
- Incorporating local kubernetes cluster running 5G core with Axonect Enterprise Enabler for orchestration.
- Develop a 5G use-case (Automated acid dilution plant simulation) and demonstrate it with the deployed 5G setup.

# Undergraduate Projects

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## 5G Powered Smart Warehouse - Final Year Project

**TECH STACK :** OPENAIRINTERFACESG, SRSRAN, DOCKER, SOFTWARE DESIGNED RADIOS, PYTHON, FLASK, UNITY, RASPBERRYPI

Jul. 2024 - PRESENT

- This is our final year group project spanning semester 7 & 8.
- The objective is to develop a 5G powered smart warehouse environment consisting of AGVs (Automated Guided Vehicles), sensors and actuators and a 5G network with slicing capabilities to connect them with warehouse management applications.
- We develop AGV, sensors and actuators prototypes and simulation applications, warehouse main-server application and a 3D-Digital twin of the warehouse environment.
- We deploy a 5G network using OpenAirInterface5G and srsRAN with slicing capabilities to connect the AGVs, sensors and actuators with the warehouse management applications.
- The 3D-Digital twin of the warehouse environment is developed using Unity and the warehouse management applications are developed using Python and Flask.
- We use Software Defined Radios such as USRP N310 and 5G modules such as Quectel RM500Q to develop the prototypes and simulation applications.
- This project aims to demonstrate the capabilities of 5G in enabling smart warehouse environments and to provide a platform for further research and development in the field of 5G powered smart warehouses.

## Hybrid Farm - Game Development

[Github Link](#)

**TECH STACK :** UNITY, C#, SPRINGBOOT, REACT, MYSQL

Feb. 2024 - Jul. 2024

- This was a group project for the Software Design Competition module in semester 6.
- The objective was to develop a game that motivates users to save energy by integrating with an energy demand management application. The game should encourage behaviors like reducing power consumption, utilizing renewable energy, and participating in demand response programs. The game's core lies in its ability to reflect changes based on player decisions.
- We developed a 2.5D point-and-click strategic gameplay that enables the player to manage the production processes on a farm, make decisions to increase profit, and complete objectives in less time to secure a position on the leaderboard.
- The game is integrated with an energy demand management API that provides real-time data on energy consumption and production. The game's environment changes based on the player's energy consumption and production, and the player will experience the impact of their decisions on the environment.

## Vending Machines'Network - IoT Project

[Github Link](#)

**TECH STACK :** NODE-RED, JAVASCRIPT, HTML, ARDUINO

Oct. 2023 - Dec. 2023

- This was a group project for the Internet of Things module in semester 5.
- This project is a network of vending machines of a company that sells a defined set of different products.
- The main idea is to connect the vending machines in a star topology to a main server (aka admin server), to monitor the product availability in each vending machine and to provide customers with valuable information such as nearby locations, product availability in nearby locations, details of resupply schedules. Each vending machine is equipped with a convenient user interface for the customer where he/she can buy products or inquire about info.
- This implementation also benefits the company due to real-time monitoring and features like notification when products run low, and location-wise or product-wise stats, to efficiently schedule supply routines and to accurately identify the market value of products by analyzing the trends to make informed decisions on future marketing aspects.

## Flower Exchange - Trading Application

[Github Link](#)

**TECH STACK :** C++

Jun. 2023 - Sep. 2023

- This was a two-person group project for a 'C++ Workshop' offered by the 'London Stock Exchange Group (LSEG)'.
- Designed a basic trading system, where traders can submit buy or sell orders for flowers via the Trader-Application and the Exchange-Application will process the incoming order against existing orders in the order container (known as Order Book) and do a full or partial execution.
- Every order is replied to with an Execution Report by the Exchange Application indicating the status of the order. Orders sometimes could be rejected due to quantity limitations, invalid flower type, etc.

## Colour Sensing Customizable Table Lamp

[Github Link](#)

**TECH STACK :** ARDUINO, ALTIUM, SOLIDWORKS

Mar. 2023 - Jun. 2023

- This was an individual project for the Electronic Design Realization module in semester 4.
- Designed and manufactured a table lamp that has an RGB LED lamp that is color customizable according to user inputs or according to sensed colors through the sensor. It has a small OLED display and three touch buttons for user input.

## Design of Local Area Network and Routing Simulation

[Github Link](#)

**TECH STACK :** CISCO PACKET TRACER

Apr. 2023 - Jul. 2023

- This was a group project for the Communication Network Engineering module in semester 4.
- Designed a backbone network for the University of Moratuwa and the internal network of one building (ENTC).
- Several design aspects such as backbone topology, IP addressing scheme for the network, bandwidth of each link, selection of active (switches/routers) and passive components, features/specifications of the routers/switches and bill of quantities for passive and active components were considered.
- Developed the routing configuration for the backbone network using OSPF and the final design is simulated and tested using Cisco Packet Tracer software tool.

## QPSK Digital Transceiver

[Github Link](#)

**TECH STACK :** GNURADIO, GNUOCTAVE, SOFTWARE DEFINED RADIOS

Nov. 2022 - Jan. 2023

- This was a group project for the Communication Design Project module in semester 3.
- Implemented a point-to-point digital wireless communication system using GNURadio and bladeRF (software-defined radio).
- Implemented forward error correction encoding, matrix interleaving for burst errors, packetizing with access codes, bit scrambling for ease of clock recovery, QPSK modulation and clock recovery technique using polyphase clock sync, linear equalizer and Costas loop.
- Successfully transmitted audio files, live voice, bitstream and image in simulation with channel models, and successfully transmitted audio files between two bladeRFs wirelessly.

## Function Generator

[Github Link](#)

**TECH STACK :** MULTISIM, ALTIUM, SOLIDWORKS

Nov. 2022 - Jan. 2023

- This was a group project for the Laboratory Practices module in semester 3.
- The final product had to be designed to consist only of analog components.
- Designed and manufactured a function generator that can generate sine, square, sawtooth, and triangular waves with an output amplitude of 0V to 10V, and an output frequency of 20 Hz to 20000 Hz. Square pulse waveform can output a variable pulse width (1% to 99%).

## References

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