

MATHULAN SHANMUGAM

University of Moratuwa, Sri Lanka

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Personal Statement

Computer Science and Engineering undergraduate at the University of Moratuwa with hands-on experience across the full-stack – Java, Python, C++, and JavaScript – and a growing focus on backend and distributed systems. Currently building production-oriented projects spanning SaaS architecture, containerized deployments, and applied machine learning, with a strong interest in cloud computing and scalable system design.

Interests

Software Development, Web Technologies, Backend Development, Machine Learning, Software Engineering and Cloud Computing.

Education

University of Moratuwa, Sri Lanka

2023 – Present

B.Sc. Engineering (Hons) in Computer Science and Engineering

CGPA: 3.4/4.0 (Semester 4)

Kilinochchi Maha Vidyalayam

2013 – 2022

Secondary Level Education

GCE Advanced Level – 2AB Passes | District Rank 1 | Island Rank 418

Projects

INDIVIDUAL PROJECTS

CarTrade – Second-Hand Car Marketplace

2025

Tech Stack: React, Redux, Node.js, Express.js, MongoDB, AWS S3, JWT

- Built a full-stack car marketplace with a **React/Redux** frontend and a **Node.js/Express** REST API backed by **MongoDB**, supporting car listings, search/filter/sort, and dealer management.
- Implemented **JWT**-based authentication with bcrypt password hashing and role-based route protection to separate dealer and general user access.
- Integrated **AWS S3** (SDK v3) with Multer for multipart image uploads, and designed CRUD APIs for car inventory and OEM specifications with dynamic filtering by price, mileage, and color.

LumiQ – Photography Portfolio

2026

Tech Stack: Next.js, TypeScript, Tailwind CSS, Cloudinary, JWT, Vercel

- Built a full-stack photography portfolio site with a **Next.js/TypeScript** frontend and server-side API routes, featuring a public gallery with category-based filtering and a protected admin dashboard for content management, deployed on **Vercel** with continuous deployment from the main branch.
- Implemented **JWT**-based authentication (via **jose**) with httpOnly cookie sessions and middleware-protected admin routes to restrict upload/delete/edit access to authorized users.
- Integrated **Cloudinary** as a headless media backend, using tags for category organization and context metadata for structured fields (title, description, price), with drag-and-drop upload/image management interfaces, and shipped RESTful API routes for image CRUD, category listing, and authentication.

ACADEMIC PROJECTS

EcoTrack – Environmental Monitoring SaaS

2026 – Present

Tech Stack: NestJS, Next.js, React Native, PostgreSQL, PostGIS, AWS

My contribution: Backend development, database design, multi-tenancy, authentication, and system architecture

- Co-authoring the **Software Requirements Specification** for a multi-tenant SaaS platform supporting environmental incident reporting, cleanup coordination, media handling, audit logging, security, and system interfaces.
- Contributing to development using a **NestJS** REST API, **Next.js** dashboard, **React Native** mobile application, and **PostgreSQL/PostGIS** for geospatial and multi-tenant data management.
- Collaborating on system architecture decisions for tenant isolation, role-based access control, and scalable AWS infrastructure to support real-time environmental data.

Smart Waste Management System

2025

Tech Stack: Docker, Kubernetes, GitHub Actions, Prometheus, IoT

My contribution: Containerization, Kubernetes deployment, CI/CD, and monitoring

- Contributed to deployment engineering of a distributed smart waste collection platform integrating **IoT edge devices**, routing intelligence, and a real-time tracking dashboard.
- Containerized services with **Docker**, configured **Kubernetes** orchestration and scaling, implemented **CI/CD** workflows, and configured **Prometheus** monitoring.
- Set up automated build and deployment pipelines to streamline releases and improve system reliability across development and production environments.

Microbanking and Interest Management System

2025

Tech Stack: Next.js, React, TypeScript, Chart.js, REST APIs

My contribution: Frontend development, dashboard design, and REST API integration

- Developed the **agent-facing frontend** using **Next.js, React, and TypeScript** for managing customers, savings accounts, fixed deposits, deposits, withdrawals, transfers, and reports.
- Designed reusable and responsive UI components for core banking workflows, including account opening, transaction processing, fixed-deposit management, and financial reporting.
- Integrated the frontend with **REST APIs** to retrieve and update banking data, and implemented dashboard visualizations using **Chart.js** to present account and transaction information clearly.

Core Competencies

Programming Languages: JavaScript, Python, C++, Java

Technical Fields: Full-Stack Development, Backend Development, Machine Learning, Cloud Computing

Databases: PostgreSQL, MySQL, MongoDB

Frameworks & Libraries: React, Node.js, Express.js, Next.js, NestJS, Spring Boot

Tools & Services: Git, GitHub, Docker, Kubernetes, AWS, Render, Prometheus, Hugging Face, VS Code

Leadership & Teamwork

Fast Learning & Adaptability

Problem Solving

Creativity & Effective Communication

Online Courses

Supervised Machine Learning: Regression and Classification | [Certificate](#)

Foundations: Data, Data, Everywhere | [Certificate](#)

What is the Metaverse? | [Certificate](#)

Cybersecurity for Everyone | [Certificate](#)

References

Prof. Dulani Meedeniya

Current Semester Supervisor

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