RASIKA SRIMAL SAMARANAYAKA

Software Engineer • Backend • ML • Data

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Summary

Backend & data engineer with strong experience in designing REST APIs, building ML-powered applications, and delivering secure, scalable solutions. Skilled in **Python**, **Java**, **SQL**, and **TypeScript** with hands-on expertise in **Flask**, **Spring Boot**, **Express**, and **Next.js**. Solid background in analytics and machine learning using **Pandas**, **NumPy**, **TensorFlow**, **Scikit-learn**, and **Power BI**. Passionate about performance optimization, clean architecture, and production-grade engineering.

Experience

Back-End Developer (Hybrid) – NSBM for Career & Entrepreneurship (NFORCE) *Aug 2024–Mar 2025*

- Developed REST APIs using **Java** and **Spring Boot** for data management and automated workflows.
- Improved service performance by optimizing queries, reducing response times, and eliminating redundant operations.
- Implemented clean, modular components following SOLID principles and internal code standards.
- Collaborated with product and QA teams, contributing to feature design, Git-based workflows, and code reviews.

Java Spring Boot HTML CSS
React.js LaTeX GitHub Docker

Education

BSc (Hons) in Software Engineering (MOHE), NSBM Green University, Sri Lanka *2021–2025*

GPA: 2.93
Course Highlights include Algorithms and Data Structures, Database Management Systems, Operating Systems, Software Architecture, Software Quality Assurance, Advanced Mathematics for Computing, Data Warehousing and Data Mining, Artificial Intelligence, Enterprise Application Development, Software Verification and Validation, and an Industry Internship.
Key Results:

Module Name	Grade
Advanced Mathematics for Computing	**A+**
Statistics for Computing	**A**
Programming in C	**A**
Database Management Systems	**A**
Data Warehousing and Data Mining	**A**
Web Based Application Development	**A-**
Software Quality Assurance	**A-**
Advanced Database Management Systems	**A-**

GCE Advanced Level (Physical Science Stream) – Z-Score: 1.0515 *2011–2020*
School: Bandarawela Dharmapala Maha Vidyalaya

Subject	Grade
Combined Mathematics	**C**
Chemistry	**B**
Physics	**C**
General English	**A**
GIT	**A**

Projects

Heartlytics – ML-powered heart risk platform

- Built an end-to-end heart disease risk web app that delivers real-time and batch predictions with interactive dashboards and PDF reporting.
- Designed a modular Flask backend with Random Forest scoring service, robust CSV ingestion (column mapping, cleaning, outlier detection, imputation), Celery workers, and RBAC-secured doctor/admin portals.
- Improved reliability and safety by hardening auth (Flask-Login, MFA/TOTP, email OTP, session controls), adding application-level encryption, and making batch predictions resilient to schema issues and missing values.
- Solved data quality and UX challenges by normalizing heterogeneous clinical inputs, enforcing strict validation, and surfacing explainable risk bands and trend simulations over time.

Python	Scikit-learn (Random Forest)	Flask	Celery
Pandas	NumPy	SQLite	PostgreSQL
Bootstrap 5	Security (CSRF/MFA)		

Spaced Repetition App – Offline-first adaptive study planner

Local-first spaced repetition studio that adaptively schedules reviews to keep high-risk topics and exam prep on track.

- Designed forgetting-curve engine and risk scoring (adaptive-scheduler, forgetting-curve) plus persisted Zustand stores and selectors powering Today, dashboard, and timeline views.
- Improved review efficiency with retention-aware queues, calendar heatmaps, and SVG/PNG exports, enabling quick triage and sharable study plans without a backend.
- Solved offline-first and upgrade challenges using versioned localStorage snapshots with migrations to keep historical data and analytics consistent across releases.

Live preview

Next.js 14	React 18	TypeScript	Zustand
Tailwind CSS	Radix UI		

FluxCast Urban – Urban energy demand forecasting dashboard

Built an urban energy intelligence dashboard with district-level heatmaps, rankings, and scenario simulations backed by an R analytics service.

- Designed a Next.js 16 App Router frontend plus `/api/districts` route with in-memory GeoJSON cache, React context store, and D3/Plotly maps and tables over synthetic energy features.
- Reduced latency and external dependencies by serving static GeoBoundaries data from the app and reusing enriched features across pages to align dashboard TTI with a ~2s KPI target.
- Standardised contracts between Next.js, a Node ETL worker, and R/Plumber forecasting APIs so models and data pipelines can evolve without breaking the dashboard.

Live preview

Next.js 16	TypeScript	React	Tailwind CSS
D3	Plotly	Mapbox GL	Node.js

InsightLedger – AI-powered personal finance assistant

Full-stack MERN platform for tracking income, expenses, budgets, and AI insights to improve personal financial decisions.

- Built secure JWT/RBAC API with Node/Express, using MongoDB aggregations for dashboards and analytics plus a Gemini-backed AI chat and suggestions service.
- Implemented a React dashboard with protected routes, transaction and budget management, and real-time charts driven by analytics endpoints.

Node.js	Express	TypeScript	MongoDB
Mongoose	React	@google/generative-ai	

Code Origin Detector – AI vs. human code classifier

Research-grade toolkit that predicts whether source files are human- or AI-authored with probabilistic, explanation-rich verdicts for Python/JavaScript codebases.

- Implemented an end-to-end detection pipeline with AST and stylometry featurizers, heuristic agents, scikit-learn models, a Typer CLI, and a React dashboard for interactive analysis.
- Improved review workflows by surfacing calibrated probabilities, top heuristic explanations, and benchmark metrics (macro F1, AUROC, confusion matrix) from manifest-driven evaluations.
- Designed a pluggable agent architecture and feature index to add new languages and models without breaking pipelines, while keeping heuristic-based explanations interpretable and stable.

Python | Typer | Rich | Scikit-learn
NumPy | pandas | React | TypeScript
Vite | Tailwind CSS

Handwritten Digit Recognition – MNIST TensorFlow classifier

Built and trained a neural network that classifies MNIST handwritten digits from raw pixel images for fast, automated recognition.

- Designed a `tf.keras.Sequential` model with two 128-unit ReLU hidden layers and a 10-class softmax output, using SGD and categorical cross-entropy.
- Implemented preprocessing (784-dim flattening, normalization, one-hot labels) to stabilize training and improve test accuracy and generalization.
- Structured a reproducible notebook pipeline from data loading through evaluation and prediction on the held-out test set.

Python | TensorFlow | Keras | NumPy
Jupyter

COVID-19 Data Visualization – Interactive global pandemic insights

Built an interactive analytics notebook to explore global and country-level COVID-19 spread, deaths, and lockdown effects using public datasets.

- Implemented choropleth maps, time-series line charts, and bar plots for infection and death trends plus maximum infection rates across countries.
- Modeled lockdown windows for Sri Lanka and Italy, annotating timelines to compare infection and death-rate dynamics before, during, and after interventions.

Python | Pandas | NumPy | Plotly Express
Jupyter | Matplotlib

Technical Skills

Languages

Python | Java | JavaScript | TypeScript | Dart | HTML | CSS

Frontend & Frameworks

Next.js | React | Tailwind CSS | Flutter | Lucide Icons | Zustand | Radix UI

Backend & Databases

Flask | Spring Boot | Node.js | Express | REST APIs | SQL

Data & Analytics

Pandas | NumPy | Microsoft Power BI | Matplotlib | Seaborn | Plotly Express | Excel

Data Practice

Data Cleaning | Feature Engineering | EDA

Machine Learning

TensorFlow | Scikit-learn | CNNs

Tools & Platforms

Git | GitHub | Jupyter | VS Code | LaTeX | Docker | Postman

Certifications

Data Analytics Professional Certificate
Description: Exploring data roles, visualization, statistical methods, and communicating regression/ML insights.
Skills: Data Analysis, Regression, Visualization (Tableau), EDA, Hypothesis Testing, Sampling, Feature Engineering, Python and OOP, Data Storytelling, Advanced Analytics.
Courses:
- Foundations: Data, Data, Everywhere
- Ask Questions to Make Data-Driven Decisions
- Prepare Data for Exploration
- Process Data from Dirty to Clean
- Analyze Data to Answer Questions
- Share Data Through the Art of Visualization

Advanced Data Analytics Professional Certificate
Description: Advanced Python, statistics, and ML for business-ready analytics; translating complex findings into stakeholder-friendly insights.
Skills: Data Analysis, Regression, Visualization, Advanced Analytics, Data Ethics, Feature Engineering, Python Programming, Data Presentation, Data Science.
Courses:
- Foundations of Data Science
- Get Started with Python

Power BI Data Modeling and Analytics Specialization
Description: Modeling star schemas, DAX calculations, performance tuning, and visual analytics for business reporting and time-based insights.
Skills: Star Schema Design, Power BI, Data Modeling, ETL, DAX, Performance Tuning, Time Series Analysis, Data Visualization, Data Analysis, Database Design.
Courses:
- Data Modeling in Power BI
- Extract, Transform and Load Data in Power BI
- Harnessing the Power of Data with Power BI
- Preparing Data for Analysis with Microsoft Excel

Introduction to TensorFlow for AI/ML
Description: Built and trained neural networks for computer vision with TensorFlow and Keras; applied convolutions and production-ready ML best practices.
Skills: TensorFlow, Keras, Computer Vision, Deep Learning, Image Analysis, Artificial Intelligence.
Credential: Verify Credential

Introduction to Databases
Description: Core database concepts, design principles, and lifecycle; practiced querying and data manipulation with SQL/MySQL and relational models.
Skills: Database Design, SQL, Relational Databases, Data Manipulation, Query Languages, Database Integrity, MySQL, Database Administration.
Credential: Verify Credential

Version Control
Description: Implemented Git workflows and GitHub repo management from the CLI; branching, merging, and versioning for collaborative development.
Skills: Git, GitHub, Command Line, Software Versioning, Linux/Unix Commands, File Management.
Credential: Verify Credential

Certifications

Description: Complex joins, unions, sub-queries, and aggregation patterns; algorithms and data structures fundamentals.
Skills: SQL, Data Modeling, Query Optimization, Algorithms, Data Structures.
Credentials:

- SQL (Intermediate)
- SQL (Basic)
- Problem Solving (Basic)

Research Methodologies

Description: Qualitative and quantitative research design, sampling, data collection, survey design, interviewing, and market research.
Skills: Research Design, Sampling, Survey Creation, Interviewing, Market Research, Probability and Statistics.
Credential: Verify Credential

Problem Solving Using Computational Thinking

Description: Applied computational thinking patterns to real-world case studies; developed algorithmic solutions using CS fundamentals.
Skills: Computational Thinking, Algorithms, Programming Principles, Problem Solving, Computer Science.
Credential: Verify Credential

Awards

Math Competition, Honourable Mention (Merit Award, Intermediate Category)

Organization: University of Moratuwa (ENTC) Date: Aug 2020
Description: Placed in the top 10 (Honourable Mention) for the Intermediate category and featured in the official winners announcement.
Focus Areas and Skills: Mathematical problem solving; quantitative reasoning; competition-level math; time-pressured analytical thinking.
Links: Official Announcement | Certificate