Imasha Jayarathne

ARTIFICIAL INTELLIGENCE UNDERGRADUATE

Gampaha, Sri Lanka.
+94 76 485 5297
imashanilupul@gmail.com

Linkedin
Github
Medium

Profile Summery

AI Undergraduate with a strong foundation in artificial intelligence, machine learning, and data-driven problem solving. Passionate about developing intelligent systems that can drive innovation and solve real-world challenges. Adept at programming, algorithm development, and analytical thinking. A fast learner and critical thinker with strong teamwork, communication, and problem-solving skills. Motivated, detail-oriented, and always eager to explore new advancements in AI, robotics, and cybersecurity.

Experience

Media Lead & Electronics Member | IES Labs UoM — 2024 - PRESENT

- Led the media team in planning, producing, and publishing content across multiple platforms.
- Maintained and troubleshooted electronic components and prototyping tools.
- Designed and developed custom electronic circuits and embedded systems for lab projects.
- Coordinated team tasks, timelines, and project goals to ensure high-quality media output.

AL ICT Teacher | Self employed — 2022 - 2025

- Delivered comprehensive A/L ICT lessons of the national syllabus
- Provided personalized academic guidance and ICT career counseling for students.

Education

Bachelor of science honors (UG) in Artificial Intelligence — 2023 – PRESENT

University of Moratuwa

Bandaranayake College Gampaha | Physical Science — 2013 - 2022

- G.C.E. Advance Level : 1 A passes for IC.T. & 2 B passes for Physics & Com. Maths. (Z Score - 1.83)
- G.C.E. Ordinary Level : 9 A passes.

Technical Skills

- **Languages** – Python, Java, Javascript, C, C++, php
- **Frontend Development** – React, Vite, MaterialUI, Tailwind CSS
- **Backend Development** – FastAPI, NodeJS, Firebase
- **Mobile development** – Flutter
- **Database** – MYSQL, MSSQL, PostgreSQL, MongoDB, Vector Databases(chromaDB),
- **AI & ML** - Scikit-learn, Langchain, laamaIndex, MCP
- **Cybersecurity Tools** – Nmap, Burpsuite, Metasploit
- **Embedded Systems** – Arduino, ESP32, PID Controlling, EasyEDA
- **Project Management** – Jira, Trello
- **Software Testing** – pytest, TestNG
- **Tools** – Github, Git, Figma, Webots, Cisco Packet Tracer, Goolge colab, Jupyter, Postman

Soft skills

- Leadership & Management
- Problem Solving
- Communication
- Critical Thinking
- Team Collaboration

Projects

VizGen – AI Graphs and Chart Generator

Technologies: Python, LangChain, Langsmith, GeminiAPI, FastAPI, React, MongoDB, ChromaDB, Ploty.js, MaterialUI, Emailjs, Tavily API, Email.js

- Building a full-stack intelligent web application that allows users to generate insightful visualizations from databases using natural language prompts.
- Integrates LangChain with Gemini for advanced text-to-SQL translation and automatic chart recommendations based on prompt intent and metadata analysis.
- Supports RAG-based table selection to handle large multi-table datasets and improve accuracy in visual generation.
- Dynamically generates graphs such as bar, pie, line, scatter using plotyjs based on user queries and inferred data types.
- Allows users to give feedback on each chart to improve generation through active learning techniques.
- Implements a smart chat interface with Typewriter-style UI to interact with the system and explain visualizations.
- Backend built with FastAPI and MongoDB for scalable API and data handling; frontend developed in React with MaterialUI for a responsive UX.
- Use multi agent workflow for manage whole system.

Fast Line Following Robot V2.0 (Hardware)

Technologies & Components: ESP32, 500 RPM DC Motors, TB6612FNG Motor Driver, Custom IR Sensor Array, PID Control, Bluetooth, 7.4V LiPo Battery

- Designed a high-speed line-following robot capable of efficiently navigating and solving mazes using real-time pathfinding logic.
- Used PID control for precise line tracking and implemented a Bluetooth interface for dynamic PID tuning during operation.
- Developed an adaptive detection system that switches between black and white line modes.
- Programmed efficient maze-solving algorithms to handle complex intersections and dead ends.
- Leveraged the ESP32 microcontroller for advanced processing and control.

Juice App – Juice selling App

Technologies & Components: Flutter, Dart, Firebase Authentication, Firebase Realtime Database, REST APIs

- Developed a full-featured e-commerce mobile application for ordering fresh juices with doorstep delivery.
- Designed an intuitive user interface in Flutter, allowing users to easily browse and order a variety of juice options.
- Integrated Firebase Authentication for secure user login and account management.
- Implemented Firebase Realtime Database to manage juice listings, user preferences, and order data in real time..
- Ensured smooth user experience by optimizing app performance and implementing clean, scalable architecture.

Color Following Robot Simulation – Webot (Robotics)

Technologies & Components: Webot, Python, Wall Following Algorithm

- Developed a simulated wall-following robot using the e-puck platform in Webots, designed to follow walls based on their color (e.g., red, green, blue).
- Utilized the robot's onboard camera to implement real-time color detection and decision-making logic for navigation.
- Programmed behavior-based control in Python to dynamically follow walls of a target color while ignoring others.
- Integrated distance sensors for collision avoidance and smooth corner handling within the maze environment.
- Tested and validated the robot's performance under different maze layouts and lighting conditions.
- Optimized sensor fusion and threshold tuning for robust and consistent color-based wall detection.

Chronix – Active time tracker V1.0.0 (Chrome web extension)

Technologies & Components: React, Tailwind CSS, Chrome Extension APIs, Manifest V3

- Developed Chronix, a modern productivity-focused Chrome extension that delivers real-time tab usage insights and enhanced browser interaction.
- Built the UI with React and Tailwind CSS, offering a clean user experience.
- Designed using Chrome's Manifest V3 architecture, with separate popup and background scripts for efficient state management and performance.
- Established real-time communication between popup and background via Chrome runtime messaging for seamless user interactions.
- Currently developing v1.1.0, introducing a Dark Mode / Light Mode toggle and laying the groundwork for premium features, including advanced analytics and personalized productivity suggestions.
  .

Extra Readings

AI Agents Fundamentals - Hugging Face

Introduction to MongoDB – MongoDB

Introduction to Android Mobile Application Development – Meta

AI For Everyone – DeepLearning.AI

Reference