ISULA DISSANAYAKE

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PROFILE

Computer Science undergraduate specializing in Artificial Intelligence at Coventry University, with hands on experience in building machine learning systems, retrieval augmented LLM applications, and computer vision pipelines. Interested in applied AI systems, data driven problem solving, and model deployment. Known for adaptability, creativity, and effective teamwork, with a strong motivation to contribute to real world technology solutions and continue growing through applied AI research and development.

EXPERTISE

AI & Machine Learning | Deep Learning | Computer Vision | Natural Language Processing | Retrieval Augmented Generation (RAG) | Data Science | Web Development | AI Application Development

SKILLS

- Programming Languages
  Python, C++, Java, SQL, R, JavaScript, HTML, CSS, Markdown
- Machine Learning and AI
  Machine Learning, Deep Learning, Neural Networks, Transformer-based Models, BERT, Attention Mechanisms, Large Language Models, Retrieval Augmented Generation (RAG), Prompt Engineering, Generative AI Concepts
- Data & Databases
  Data Analysis (NumPy, Pandas, Seaborn), MySQL, MongoDB
- Soft Skills
  Problem Solving, Critical Thinking, Teamwork & Collaboration, Fast Learning, Leadership, Ability to Work Under Pressure

PROJECTS

SYNAPSE Autonomous Healthcare Robot | ESP32, Firebase, C++, IoT, Robotics | GitHub Repository

Developed an autonomous healthcare assistant robot for hospital environments using a dual-ESP32 architecture, real-time sensor processing, and IoT integration.

- Designed dual microcontroller architecture separating sensor processing and motor control for reliable real-time operation
- Implemented omnidirectional navigation using Mecanum wheel kinematics and line following algorithms
- Built human following and obstacle avoidance system using ultrasonic, IR, and color sensors
- Integrated Firebase for real time patient monitoring and remote robot control
- Applied Kalman filtering and sensor fusion techniques for stable navigation and environmental awareness

Info Sage AI | LLaMA-2 13B, QLoRA, RAG, FAISS, Flask | GitHub Repository

Built a local LLM based educational assistant using LLaMA-2 13B with 4-bit quantization (QLoRA) optimized for low VRAM GPUs (8GB). Implemented a retrieval system using FAISS and Sentence Transformer embeddings for knowledge grounding.

- Fine-tuned model on 1M+ educational samples (FineWeb-Edu subset | Hugging Face)
- Built document retrieval system using FAISS
- Optimized inference for low-memory environments using quantization
- Designed structured prompting pipeline to improve response reliability and reduce hallucinations

YouTube Agentic RAG System | OpenAI GPT-4o, Whisper, ChromaDB, YouTube API | GitHub Repository

Built a system that converts YouTube channels into searchable text knowledge bases using transcript extraction and vector search.

- Used ChromaDB for storing transcript embeddings
- Applied OpenAI embeddings for semantic search
- Integrated Whisper for transcription when captions unavailable
- Built query system for context-based answers

- Implemented access handling for private or restricted videos

Chess Vision with Stockfish Integration | OpenCV, TensorFlow, Python-Chess | GitHub Repository

Built a system that detects chessboard positions from images and converts them into FEN notation for Stockfish analysis.

- Applied OpenCV homography for perspective correction
- Trained CNN for chess piece classification
- Generated FEN from board state reconstruction
- Integrated Stockfish for move evaluation
- Combined classical computer vision with deep learning for board reconstruction

Calorie Sense AI | TensorFlow, Flask, Gemini API, OpenWeather API | GitHub Repository

Developed a calorie estimation and fitness recommendation system using physiological equations and machine learning.

- Built neural network model using TensorFlow for calorie prediction
- Incorporated Keytel et al. (2005) physiological formula into feature engineering
- Integrated weather data using OpenWeather API for context-aware adjustments
- Built Flask backend with REST API support
- Added Gemini API for personalized fitness recommendations
- Implemented user profiling based on BMI, heart rate, and activity level

Plant Disease Detection | OpenCV, SVM, Scikit-learn | GitHub Repository

Built a computer vision system to classify plant leaf diseases using handcrafted image features.

- Extracted HSV color histograms and texture features (GLCM)
- Trained SVM classifier with RBF kernel
- Achieved 95% accuracy using 5-fold cross validation
- Implemented segmentation pipeline to isolate leaf regions

Customer Segmentation | Scikit-learn, PCA, KMeans, DBSCAN | GitHub Repository

Built an unsupervised learning model to segment retail customers based on behavior and spending patterns.

- Applied clustering algorithms including KMeans, GMM, DBSCAN, and hierarchical clustering
- Used PCA for dimensionality reduction and visualization
- Evaluated models using Silhouette Score (0.42 best result)
- Generated customer groups for marketing insights
- Saved trained pipeline using joblib for reuse

Skin Color Detection (Chromaticity Model) | Python, NumPy, OpenCV | GitHub Repository

Implemented a statistical model to detect skin regions using chromaticity transformation and probabilistic classification.

- Converted RGB images into chromaticity space for lighting invariance
- Modeled skin pixels using multivariate Gaussian distribution
- Classified pixels using Mahalanobis distance
- Tuned threshold using dataset evaluation

Xpress Rental | Java, Swing, OOP | GitHub Repository

Developed a desktop vehicle rental system using Java Swing.

- Built GUI based system for vehicle booking and management
- Implemented Singleton pattern for session handling
- Developed rental pricing logic with discount rules
- Used file-based storage for persistence

Ceylon Travels | HTML, CSS, JavaScript | GitHub Repository

Developed a responsive travel website for showcasing tourism destinations in Sri Lanka.

- Built multi-page website using HTML, CSS, and JavaScript
- Designed responsive layouts using Flexbox and Grid

- Added interactive UI elements and enquiry form handling
- Improved user experience with clean navigation and animations

EDUCATION

BACHELOR'S DEGREE | Computer Science with Artificial Intelligence | Coventry University 2024 – 2027
FOUNDATION PROGRAMME | BCI Campus, Negombo 2023 – 2024
ADVANCE LEVEL | Physical Science Stream | Loyola College, Bopitiya 2010 – 2023

CERTIFICATIONS

- Google Cloud Skills Boost
  - Create Image Captioning Models — Credential ID: 10089141
  - Transformer Models and BERT Model — Credential ID: 10087739
  - Encoder-Decoder Architecture — Credential ID: 10083236
  - Introduction to Image Generation — Credential ID: 10067062
  - Introduction to Generative AI — Credential ID: 10066588
  - Introduction to Large Language Models — Credential ID: 10065439
  - Trust and Security with Google Cloud — Credential ID: 10055426
  - Innovating with Google Cloud AI — Credential ID: 10051789
  - Introduction to Responsible AI — Credential ID: 10051523
- AI & Machine Learning Certifications
  - Build Reliable Agentic AI Applications | AI21 Labs — Credential ID: 10065291
  - Introduction to Neural Networks | Simplilearn — Credential ID: 10054519
  - Prompt Engineering with GitHub Copilot | Microsoft — Credential ID: 10052069
- Business & Communication Certifications
  - Certificate in Advanced Business English | American Center — 2021 (Credit)
  - Certificate in Spoken English | Headway Learning Solutions — 2021 (Distinction)
  - Certificate in Written & Spoken English | CALSDA — 2010–2018 (Honours, Level V)
- ICT Certification
  - Certificate in ICT Skills | IDM Nation Campus — 2015 (Distinction)

EXTRACURRICULAR ACTIVITIES

Photographer | BCI Campus, Ugrads Media 2024 – 2025
Photographer | Loyola College Photography Art Society 2022 – 2023
Announcer | Loyola College Media Unit 2022 – 2023
Senior Prefect | Loyola College 2021 – 2023
Cricket Player | Loyola College 2016 – 2020
Chess Player | Loyola College 2016 – 2018
Junior Prefect | Loyola College 2014 – 2017

ACHIEVEMENTS & AWARDS

Creative Writing (English) | 2nd Place | Loyola College 2023
Impromptu Speech (English) | 2nd Place | Loyola College 2022
Creative Writing (English) | 1st Place | Loyola College 2022
Under-20 Football | 3rd Place, Interhouse Athletic Meet | Loyola College 2020
Under-20 Cricket | 2nd Place, Interhouse Athletic Meet | Loyola College 2020
Under-20 Chess | 1st Place, Interhouse Athletic Meet | Loyola College 2020

REFERENCES

Available upon request (LinkedIn recommendations available)