Adithya Neelakantan

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EDUCATION

Syracuse University, Syracuse, New York *August 2023 – May 2025*
Master of Science – Computer Science **GPA: 3.71/4.00**
Relevant Coursework – Design and Analysis of Algorithms, Artificial Intelligence, Natural Language Processing, Operating Systems, IOT and App Development, Database Management, Social Media Data Mining, Machine Learning

Vellore Institute of Technology, Vellore, India *July 2019 – June 2023*
Bachelor of Technology – Electronics and Communication Engineering **CGPA: 8.29/10.00**
Relevant Coursework – Data structures and Algorithms, Deep Learning, Information Theory and Coding, Computer Vision and Pattern Recognition, Computer Architecture, Statistics and Probability, Analog and Digital Communications

EXPERIENCE

Syracuse University
ECS Research Assistant Intern *June 2025 – Present*
- Creating an adaptive AI Agent with Continual Learning using LLMs that learns from user interactions over time.
- Integrated vector-based long term memory management, lightweight fine-tuning (LoRA), with tools for feedback-driven self-assessment modules to enable personalized learning and context retention.
- Studying cognition in Agentic systems, how agents evaluate confidence, adapt communication patterns, and bridge learning gaps through Retrieval-Augmented Generation (RAG) and self-reflective reasoning.

Intel
Graduate Technical Intern *June 2024 – August 2024*
- Developed a machine learning model using hierarchical clustering to analyze patterns from Intel's SoCWatch profiler, focusing on chip-level power states (C and P).
- Profiled CPU and GPU workloads to analyze performance and power trade-offs, insights applicable to GPU-accelerated inference.

Srijan Technologies
Data Science Intern *June 2021 – July 2021*
- Predicted respiratory disorders using a custom CNN-based deep learning model to analyze voice notes.
- Converted audio samples into Mel spectrogram images to detect subtle respiratory illness markers through advanced signal processing. Analyzed Mel spectrogram of 10,000+ voice recordings, identifying chronic respiratory disorders with 92% accuracy.

ACADEMIC PROJECTS

AIoT Smart Classroom System *(Hardware simulation: Wokwi, ThingSpeak; Software: Python)*
- AIoT-based smart education platform integrating RFID and Wi-Fi validation for secure, fraud-proof attendance tracking and AI-powered classroom assistance to enhance student engagement, prioritizing communication across systems working together in an ecosystem.
- Implemented dynamic quiz generation and smart environmental control using AI and IoT, streamlining administrative tasks and optimizing learning conditions in real-time.

Mental Health Categories on Reddit *(Python, Keras, NLTK, Gensim, Pandas)*
- Applied LSTM and Structured Perceptron models, to classify and analyze Reddit posts by mental health categories such as anxiety, depression, and suicidal ideation.
- Building an NLP based pipeline – from digital trace data analytics, preprocessing to topic modeling, classification, and evaluation—achieving strong performance in identifying high-risk mental health content.

Movie Review Analysis for Letterboxd Data *(Python, Jupyter Notebook, PyTorch, HuggingFace, NLTK)*
- Performed multi-faceted analysis of Letterboxd movie reviews using Python and HuggingFace transformers, focusing on sentiment, genre, user engagement, sarcasm, and temporal patterns.
- Pre-trained HuggingFace models and NLTK features to extract sentiment and linguistic cues, enabling nuanced understanding of user opinions, biases and trends over time.

AI-Driven Gomoku Algorithm *(Python, Jupyter Notebook, NumPy, Pandas)*

- AI-based Gomoku game using the Minimax search algorithm with a custom heuristic evaluation function, considering immediate threats and multi-step future outcomes.
- Enhanced the model's adaptability through dynamic strategy evaluation, achieving about an 85% win rate against advanced human players and optimizing decision latency for real-time gameplay.

Detection of Melanoma using Computer Vision *(Capstone Project, VIT)* *(Python, OpenCV, NumPy, Pandas)*

- Melanoma detection system using ResNet50 and EfficientNet CNNs, classifying over 50,000 dermoscopic images of skin lesions with 97.6% accuracy.
- Applied data augmentation and transfer learning to improve model generalization by 70%, enabling robust diagnosis under variable lighting conditions and skin tones.

Vehicle Detection using Mask R-CNN *(Python, TensorFlow, Keras, OpenCV)*

- Designed and trained a Mask R-CNN model for vehicle and pedestrian detection, achieving 96.1% mAP across 25,000+ test images.
- Optimized model throughput for real-time detection at 30 FPS, maintaining over 95% accuracy in low-light and occluded environments.