

RAMKUMAR MUNIANDI VALLIMAYIL

15/1, Kamatchi nagar, 1st street, Nallur, Tiruppur, Tamil Nadu, India. Pin:641606

Email: ramkumar.vallimayil@gmail.com; Phone: +919994706307; GitHub: [ramkumar-mv](#)

LinkedIn: [ramkumarmv](#) Portfolio: [ramkumarmv](#)

OBJECTIVE

- To pursue an **MS in Data Science** with a specialization in **AI/ML**, focusing on advanced techniques in **computer vision, generative AI, and automation**.
- Through this program, I aim to upgrade my skills in **data modelling, adaptive learning systems, and LLM fine-tuning**, particularly in **computer vision and generative AI** research.
- After completing my MS, I aspire to work as a **Machine Learning Research Scientist** or **Data Scientist**, driving innovative advancements in **computer vision and generative AI** for impactful solutions.

ACADEMIC QUALIFICATION

- 9.58 CGPA. Bachelor of Technology (Electronics and communication), SRM Institute of Science and Technology, Chengalpattu **Sept 2020 - May 2024**

TECHNICAL SKILLS

- SQL, C, Python, Git, TensorFlow, PyTorch, NLP, OpenCV, FASTapi, Flask, Docker, Kubernetes, MLFlow, AWS (S3, EMR, Redshift, RDS, Lambda, Glue), Snowflake, Predictive analysis, Excel, Tableau, Scikit-Learn, Raspberry Pi

WORK EXPERIENCE

IIT Madras, Project Associate

Sept 2024 - Present

- Working with the Indian Army to develop a real-time face and motion detection system using thermal imaging and computer vision, with automated alerts for unknown individuals over long distances using Wirepas technology.
 - Employee of the month - October 2024

PUBLICATIONS

- [Adaptive LSTM Forecasting for RO Membrane Fault Detection](#) - To be published
- [A Hybrid Approach to License Plate Recognition: YOLO-v9 and Quantum-Enhanced CNN Model](#)
- [Dynamic Course Optimization Using Machine Learning in Learning Management Systems](#) - To be published
- [Crop Care AI: The smart farming revolution](#) - To be published

INTERNSHIPS

Title: AI/ML Engineer (Gemicates Technologies Pvt Ltd - Chennai, India)

June 2024 - Aug 2024

- Developed an adaptive home automation system tailored to specific users and deployed with TinyML. Built a high-accuracy (98%) ANPR-based security system (Unique OCR engine for License Plate Texts) for Indian Oil Corporation Ltd., significantly improving security measures.

Title: AI Intern (Adil Textiles Private Limited - Tiruppur, India)

Jan 2024 - May 2024

- Using ResNet-50 CNN, an AI-powered fabric defect detection system was created that reduced manual inspection time by 80% while detecting textile flaws with 96% accuracy. LSTM neural networks were used to implement a predictive maintenance solution that reduced equipment downtime by 30% through proactive monitoring and real-time anomaly detection.

Title: Machine Learning Intern (MITACS Globalink Research - Toronto, Canada)

June 2023 - Sept 2023

- Worked with [Austin Page](#) and [Prof. Akramul Azim](#) to create EcoPal, to cut carbon emissions via IoT and Machine Learning. It encompasses two core functions: utilizing ML to suggest activity adjustments and enabling direct control of electronic devices in Industry.

Title: Global Academic Intern (National University of Singapore - Singapore)

Dec 2022 - Apr 2023

- Developed a custom VGG neural network for retail product prediction with hand gesture detection and successfully deploying the solution on AzureML. Simultaneously conducted advanced deepfake classification research, creating a 30-layer deep learning CNN under Dr. Tan Wee Kek's guidance, with the research paper currently under peer review.

Title: Computer Vision Intern (Airdonex Technologies Pvt Ltd- Chennai, India) **Nov 2022 - Mar 2023**

- Developed an automated drone landing system employing computer vision with ArUco marker detection. Leveraged MAVROS, Ardupilot, and MAVLink to validate functions, contributing to 80% enhancement in drone system capabilities through OpenCV.

Title: IoT Intern (Qmax systems Pvt Ltd- Chennai, India) **July 2022 - Aug 2022**

- Developed an LSTM-based TinyML model for real-time energy consumption prediction with a Mean Absolute Error (MAE) of 0.04 kWh, optimized for BLE Mesh networks using ESP32 with TinyML. Integrated hardware components, including energy meters with MODBUS protocol and RS485 communication, enhancing system efficiency and reducing cloud dependency.

ACADEMIC PROJECTS

Title: Enhanced Text-to-Image Generation Through Custom Stable Diffusion Fine-tuning **Jan 2024 - Apr 2024**

Team Size: 4

Role: Team Member

Description: Developed an advanced image generation system by fine-tuning Stable Diffusion 2.1 using LoRA (Low-Rank Adaptation) techniques, achieving significant improvements in image quality and prompt adherence. Engineered a custom training pipeline focusing on artistic style transfer and detailed object generation, resulting in 92% improvement in semantic consistency between prompts and generated images. Implemented custom attention mechanisms in the decoder block, reducing artifact generation by 40%, while designing an adaptive learning rate scheduler that improved training stability by 35%. Fine-tuned on a curated dataset of 50,000 high-resolution images across multiple artistic styles, achieving a reduced FID score from 18.2 to 12.4 and 28% improved CLIP score for text-image alignment. Optimized the system through gradient checkpointing and mixed-precision training, reducing memory usage by 45% while maintaining the ability to generate 1024x1024 images in 4.2 seconds on consumer GPUs.

Title: Advanced Face-Swapping System Using Generative AI

Oct 2023 - Dec 2023

Team Size: 3

Role: Team Lead

Description: Developed a face-swapping system with a refined StyleGAN model under my direction. achieved 96% accuracy in producing realistic face swaps by concentrating on optimizing the architecture through changes to learning rates, batch sizes, and the amount of training iterations. used mixing techniques to guarantee seamless transitions between switched faces after implementing image segmentation using U-Net to separate facial characteristics. Swapped faces were seamlessly integrated across a variety of input images by adjusting the discriminator and generator loss functions to reduce artefacts. To guarantee high-quality image fidelity, the model was trained on a dataset of more than 10,000 photos, and its performance was assessed using metrics like SSIM and PSNR.

Title: Design and development of user-adaptive bubble tube & Double bubble wall panel **Jan 2023 - April 2023**

Team Size: 3

Role: Team Lead

Description: Developed an adaptive bubble tube for autism therapy, using IoT and ML to adjust sensory stimuli based on user activity. Implemented Mediapipe algorithms to classify behavioral patterns into hypoactive or hyperactive states, dynamically adjusting the tube's color, speed, and sound based on real-time user data. Integrated a Raspberry Pi with sensors to collect motion data, processed using a custom ML model trained on 1,000+ labeled sessions. Tuned hyperparameters such as learning rate (0.001) and batch size (32) for optimal classification accuracy, achieving 92% precision in behavioral detection. The system provided real-time feedback and adaptive control, significantly improving engagement during therapy sessions.

ACHIEVEMENTS

- Recipient of Performance based scholarship (SRM Institute of Science and Technology)
- Winner at SRM Hackathon 7.0 in AI/ML Domain
- Winner at SRM Project Expo'21

LEADERSHIP ROLES

- Computer Vision Team Lead in Etros Solareon Racing Team
- Technical Team Lead in Optizen SRM Student club

COMMUNITY INVOLVEMENT

- Member in Soft Computing Research Society
- Member in Solar Energy Society of India