PRADEEP RAJASEKAR

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AI Engineer

Research-focused AI engineer with extensive experience in building and deploying end-to-end AI pipelines for vision and generative AI tasks at scale. Specializes in custom model training and fine-tuning for deployment. With hands-on expertise in a range of development tools and deployment environments,. Also, a graduate with a strong academic background and research exposure in conditional generative models, attention mechanisms, and feature extraction, complemented by a solid foundation with prior expertise in software development and a deep understanding of computer vision applications.

CORE SKILLS

- Python, JavaScript
- Pytorch, Tensorflow
- Transformers, Diffusion Models
- Deepstream, Vertex AI
- Linear Algebra and calculus
- Google Clouds (GCP)
- Edge Deployment, Tensor RT
- Custom AI model training & fine-tuning
- Feature Extraction, Attention Mechanism
- Object detection and Recognition
- Conditional image generation
- Vision, LLM and Multi Modal
- Vector Embedding

PROFESSIONAL EXPERIENCE

President Information Corp 統一資訊, Taipei, Taiwan, **November 2023– Present**
AI Engineer

- As an AI engineer, led the research and development of Scalable Real-Time Planogram Compliance, selected and presented as a poster at **NVIDIA GTC 2025**
- Collaborated with Nvidia to implement its metropolis microservices with GEN AI on both cloud native and edge implementation. Which includes developing and deploying vision and language models.
- Engineered a state-of-the-art AI pipeline using custom trained models that improved Realtime object detection and recognition on occulted objects, improving capabilities by 25%, using Transformers models and vector embedding models. Leveraging Nvidia TAO toolkit, Deepstream SDK and TensorRT for hardware acceleration.
- Engineered a machine learning model that accurately predicts consumer behavior with a 95% confidence interval, processing over 5 million data points, which enhanced targeted marketing strategies.

AIBS Software Solutions, Coimbatore, India, **May 2017 – Aug 2021**
Software Developer

- Developed custom ERP software solutions with Tally, optimizing manufacturing workflows tailored to specific corporate requirements.
- Engineered a robust inventory management and tax tracking system that enhanced operational workflows, resolved 95% of software discrepancies through methodical debugging, and improved end-user satisfaction by delivering seamless, intuitive functionalities.

EDUCATION

Master's in Electrical Engineering and Computer Science,
National Taipei University of Technology, Taipei, Taiwan, GPA : 3.8/4 2021 - 2023

Bachelor of Science in Information Technology,
Sri Ramakrishna Mission Vidyalaya College, Coimbatore, India GPA :7..9/10 2011 - 2014

CERTIFICATIONS & OTHER

★ Led the project and published the work as a poster at **NVIDIA GTC 2025** on scalable AI innovation and implementation - Scalable vision AI for Planogram Compliance 2025

★ Student Association Executive Member (Event Planning Manager)
National Taipei university of Technology • International Student Association 2022 - 2023

★ National Service Scheme candidate
National Voulnteering Program 2011 - 2014

PROJECTS

github.com/Ajishpradeep

Handheld object detection on partially occulted objects

President Information Corp 統一資訊 • November 2023 - Present

- **Achieved a 30% performance boost** in object recognition accuracy within complex visual environments by designing a cutting-edge computer vision pipeline integrating custom object detection algorithms and vector embedding search.
- **Led end-to-end model training and deployment** from scratch, implementing contrastive learning and model ensemble on custom data for high-precision classification of partially occluded objects, achieving real-time processing via Nvidia TAO Toolkit and TensorRT acceleration.
- **Pioneered in-store deployment**: The models been successfully deployed on Taiwan's **X8 store (8th unmanned 7-Eleven store in Taiwan)** in Keelung.

Vision based retail inventory management

President Information Corp 統一資訊 • February 2024 -May 2024

- **Developed a vision based system to find the discrepancy between planogram and realogram** of retail store with custom detection, recognition system accompanying unique algorithm to detect the discrepancies.
- Implementation of an advanced dense object detection has been undertaken, utilizing YOLO on a custom data set.
- Proposed utilizing **vector embedding for product recognition** to compensate scalability and ease of maintenance, and implemented by fine-tuning the embedding model on custom data, which matches the performance of the prior model while training free product list update felicity.
- **Proposed for Nvidia GTC 2025**: Selected for conference submission, as a paper as well as a poster highlighting model's scalability and effectiveness in autonomous retail.

NER on label Extraction

President Information Corp 統一資訊 • April 2024 - Present

- Engineered an **LLM-assisted Named Entity Recognition** (NER) model leveraging GCP Document AI, content-aware, to extract text information from image data.
- Optimized deployment workflows through cloud-native solutions, ensuring seamless integration and reduced processing time.
- Collaborated effectively within cross-functional teams to ensure project success.

Content and Spatial Aware Generative Model for Inpainting (Research - Thesis)

National Taipei University of Technology: Research - Thesis • March 2022 - June 2023

- Proposes a Content and Spatial aware generative model for inpainting, integrating architectural and algorithmic enhancements in GAN for **image inpainting under conditions of low data availability**.
- Implements a **contextual attention block in the generator to overcome the constraint of a limited receptive field** ensuring a more comprehensive understanding of the image context.
- Mainly to address the limitations of GANs in understanding data distribution, **incorporated content and spatial attention layers in the discriminato**r, thus enhancing its capability to discern contextual information.
- By virtue of this unique attention mechanism implementation to comprehend unique features, this model **surpasses the challenges of underfitting, Mode collapse, and memorization** encountered by generative models trained with small data.

Other Projects and Experiments

- HuggingFace models and Transformers Library, for visual question answering.
- Vision transformer-based depth estimation, enhancing 3D scene understanding.
- VertexAI/Document AI model deployment and experiments.
- **On_Progress**: Reducing LLM computational cost using Kolmogorov-Arnold Networks.

Case Study

https://github.com/Ajishpradeep/Case_Study

- Breakdown into Transformers architecture in mathematical aspects
- Vector Embedding model fine tuning with triplet loss for image to image search