Richard Joseph Omega

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RELEVANT SKILLS

Machine Learning & AI: Computer Vision, NLP, LLMs, ML/DL theory (optimization, stats, linear algebra)

Programming: Python (primary), JavaScript, HTML/CSS

Frameworks & Libraries: Pytorch, Tensorflow, Scikit-Learn, Keras, OpenCV, Pandas, Hugging Face, LangChain

MLOps & Data Engineering: MLflow, DVC, Airflow, dbt, Dagster, Evidently, Docker, GitHub Actions

Cloud & Tools: AWS, GCP, Paperspace, FastAPI, Django, PostgreSQL, Redis

EXPERIENCE

Machine Learning / Artificial Intelligence Engineer **July 2023 - Current**
Freelance

- **Welding Defect Detection (Reachbots)**
    - Improved data preparation and model debugging through data-driven strategies and optimized workflows.
    - Led data gathering and annotation, ensuring data integrity and addressing mislabeling risks.
    - Fine tuned SOTA Computer Vision Models to achieve ~0.95 mIoU with low latency and structured MLOps.
- **Soil Nutrient Prediction for Enhanced Fertilizer Recommendations (IPAGE)**
    - Spearheaded data strategy for soil nutrient prediction by sourcing, cleaning, and integrating publicly available agronomic datasets across regions to augment limited client data, enabling robust model training despite initial data scarcity.
    - Conducted in-depth research on nutrient-soil-crop interactions from scientific literature to inform feature engineering and model interpretation, improving the model's domain alignment and fertilizer recommendation accuracy.
- **LLM-Driven Customer Service Chatbots for Small and Medium-sized Businesses**
    - Fine-tuned LLaMA 3.2 1B to return structured JSON (intent, orders, response); deployed via Docker + FastAPI on AWS EC2 and connected to Facebook Messenger using Ngrok.
    - Reduced customer response latency from hours to seconds, enabling real-time engagement and order tracking even outside business hours.
    - Implemented concurrent request testing and Redis queueing for high-demand clients; added test coverage and MLFlow based prompt management for LLMOps.
    - Enhanced responses through prompt engineering, SQL data injection, and integration of relevant data from public APIs; evaluated with BLEU/ROUGE.
- **Medical Imaging (Object Detection and Semantic Segmentation)**
    - Fine-tuned SSD and DeepLabv3 models for medical image detection and segmentation; enabled semi-automated X-ray annotation with high IoU and faster diagnostic review.
    - Packaged training pipeline using MLflow (via DagsHub) and Docker, enabling reproducible local deployment and streamlined inference through a Streamlit app.
    - Collaborated with radiologists to validate model outputs, improving annotation efficiency and reducing manual effort.

Computational Fluid Dynamics Engineer **March 2018 - July 2023**
Freelance

- Automated CFD workflows on Linux using OpenFOAM and Bash to simulate turbomachinery, automotive aerodynamics, and cooling systems across multiple design scenarios.
- Deployed scalable, cloud-based pipelines on AWS EC2 for parallel simulation training, improving throughput and reproducibility of physics-based experimentation.

EDUCATION

Colegio de San Juan de Letran - Calamba **June 2015 - November 2020**
Bachelor of Science in Mechanical Engineering Calamba City, Laguna

CERTIFICATIONS & TRAINING CERTIFICATES

Machine Learning and Deep Learning Specialization – DeepLearning.AI