Yug D Oswal

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EDUCATION

VIT Vellore   Vellore, Tamil Nadu, India
Bachelor of Technology in Computer Science and Engineering, ***CGPA: 9.46***   *Sep. 2022 - Present*

RESEARCH

Cone-Class of Activations, Outperforming ReLU-like Activations
Mathew Mithra Noel, **Yug D Oswal**   *Submitting to ICML, 2025*
- Learning two coordinated hyperplanes, forming a hyperstrip and dividing Euclidean space more finely.
- Achieved $\geq 3\%$ improvement in Top-1 error on ImageNet while reducing parameters by 40 million in VGG19.

Loss Switching, Novel Classification and Regression Losses
Mathew Mithra Noel, Arindam Banerjee*, **Yug D Oswal*,** *Geraldine Bessie, Venkataraman MN*   *arXiv, 2024*
- Scheduling losses based on their gradients during training using loss switching, a novel scheduling algorithm.
- Proposed regression losses functionally identical to MAE, differentiable, robust, with $\geq 1.4\%$ RMSE improvement.
- Presented losses and training algorithms outperform crossentropy, MSE, Huber, and others on 7 benchmarks.

EXPERIENCE

AI/ML Engineer   Jul. 2024 – Oct. 2024
Bharat Dynamics Limited - Ministry of Defence, India   *Hyderabad, India*
- Procured and curated a dataset for UAV detection using MATLAB scripts and the Computer Vision Toolbox.
- Researched and hypertuned SOTA object detection models, techniques, and training strategies to build a robust UAV Detection and Tracking service, tested in 4 environments, for field scenarios.
- Engineered unique edge and web migratable model deployments on isolated systems following defence policies.

Machine Learning Engineer   Feb. 2024 – Jul. 2024
WebTiga, Synergetics.AI - A Startup by a MIT AI Course Instructor   *Bangalore, India*
- Developed classical ML POCs for clients in the insurance domain. Built an audio-based car damage classifier.
- Led the ML lifecycle: data curation, model training, API creation, backend testing, deployment, and integration.
- Engineered, dockerized, and deployed agentic workflows, guardrails, context-aware chat history, and RAG pipelines for fine-tuned LLMs, with real-time integration into client-used services, reducing latency by 53%.

Project Lead   Jun. 2023 – Aug. 2023
University of Auckland & Signal Corporation Limited   *Auckland & Wellington, New Zealand*
- Led an international team, coordinating members, clients, and stakeholders to ensure seamless project execution.
- Resolved 5 real-world issues to enhance Signal Corporation's real-time threat prediction system.
- Developed a pipeline involving incremental clustering, Named Entity Recognition (NLP), and geocoding.

PROJECTS

AI/ML Research | *Tensorflow, Keras, Numpy, Pandas, Seaborn, Jupyter Lab*   May 2023 – Present
- Collaborated with Google DeepMind, E&Y professionals and the Dean of SELECT, VIT on representation learning, theoretical and empirical deep learning research, contributing to 5 papers.
- Formulated and iteratively refined hypotheses, designed experiments, and benchmarked proposed concepts.
- Trained deep and complex neural networks in multi-GPU environments on large datasets like ImageNet.

Rekindle | *Tensorflow (keras), pandas, Python, FastAPI, PostgreSQL, Ngroks, Git*   May 2023 – May 2023
- A service to aid Alzheimer's and Dementia disease patients. Featured in Intel's Developer Spotlight.
- Trained custom encoder-decoder NLP models with novel loss functions and distributed strategies, surpassing performance on the Google GoEmotions benchmark, and securing 2nd place in the Intel (BOLT) Hackathon.

TECHNICAL SKILLS

Technical: C, C++, Python, Java, JavaScript, Node.js (Express), Flutter (Dart), Firebase, MongoDB, Docker, Tensorflow, Scikit-learn, Numpy, Pandas, Seaborn, Matplotlib, Statsmodels, R, HTML, CSS
Certifications: Machine Learning Specialization, Deep Learning Specialization, DeepLearning.AI Tensorflow Developer Professional Certificate, EDA and Data Visualization (Scaler), Advanced Techniques in Tensorflow