Vignesh Edithal

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WORK EXPERIENCE

Advanced Micro Devices (AMD)   **November 2024 - present**
Senior Software Engineer - AI GPU Profiling Team   **Markham, Ontario**

· Built counter collection service interfacing with rocprofiler-sdk to intercept kernel dispatches
· Implemented iteration multiplexing in rocprofiler-compute with data imputation to circumvent hardware limitations
· Enabled profiling support for next-gen MI 350 GPUs by analyzing architecture and deriving performance metrics
· Designed SQL analysis database schema to organize derived metrics and enable baseline performance comparisons
· Automated environment setup using containers and standalone binary generation using Nuitka compiler

Advanced Micro Devices (AMD)   **May 2023 - November 2024**
Senior Software Engineer - Radeon Software Team   **Markham, Ontario**

· Finetuned CLIP and Auto Encoder models to detect interesting events in FPS gameplay with $> 90\%$ accuracy
· Trained EfficientNet models to detect visual quality artifacts in video games with $> 95\%$ correlation
· Designed efficient data collection methodology to develop > 50 GB in-house video dataset in a month
· Optimized state-of-the-art Transformer and CNN models for deployment using ONNX framework
· Improved chatbot experience using GraphRAG for efficient document search using Langchain API
· Developed automated scripts to collect 100s of GB of gameplay data using Python based OCR scipts and OBS Studio
· Visual Quality Assessment pipeline using EfficientNet distillation inspired from Google's UVQ model and Netflix's VMAF scores

D. E. Shaw   **July 2018 - July 2022**
Senior Member Technical   **Hyderabad, India**

· Enabled firm-wide hierarchical permission management feature using Python and SQL backend
· Microservices using Kafka, orchestration using Kubernetes and Docker, telemetry using Prometheus and Grafana
· Automated third party file transfers for HR using Python/Bash scripting leading to 10% ticket reduction
· Provided SRE support for production Linux RHEL cluster by debugging networking, storage, services issues

EDUCATION

University of Toronto   **September 2022 - December 2023**
MSc in Applied Computing: Deep Learning, Computer Vision, Data Science **GPA: 4.0/4.0**

IIT Madras   **December 2021 - August 2022**
Diploma in Data Science: Statistics, Machine Learning, Business Analytics **GPA: 9.3/10**

IIT Patna   **September 2014 - May 2018**
BTech in Computer Science: Algorithms, Databases, Operating Systems **GPA: 8.9/10**

PROJECT WORK

Brain Tumor MRI synthesis using aggregation of GANs [GitHub] [Report] University of Toronto

· Implemented and trained DCGAN and WGAN models from scratch with tuned hyper-parameters
· Pre-processed data using up/down-sampling and used style transfer for post processing
· Obtained PSNR and SSIM scores comparable to relevant literature
· Showcase research in poster presentation with industry/faculty and submitted conference format report

Machine learning to predict college drop out rate [GitHub]   **IIT Madras, India**

· Exploratory data analysis followed by data cleaning and transformation using scaling pipelines
· Evaluation and Hyper-parameter tuning of 10 ML algorithms from scikit-learn library
· Identify best performing combination of algorithm and parameter set for the classification problem

Insurance Premium Modelling [GitHub] [Report]   **University of Toronto**

· Grid search tuned XGBoost regression to independently model frequency and severity of insurance policy
· Geographical clustering using DBSCAN. Data Imputation using Gaussian Mixture model. Frequency encoding
· Model validation using synthetic data from SDV library Copula. Tune profit loading in a competitive setting

PUBLICATION AND RESEARCH

Novelty Goes Deep. A Deep Neural Solution To Document Level Novelty Detection. (Ghosal, Edithal et. al., COLING 2018). (aclanthology.org/C18-1237)

Is your document novel? Let attention guide you. An attention-based model for document-level novelty detection. (Ghosal, Edithal et. al., Natural Language Engineering 2022). (Journal article)

Semantically-Aware Game Image Quality Assessment. (Zhu, Edithal et. al.). arxiv paper

Gameplay Highlights Generation (Edithal et. al.). arxiv paper

TECHNICAL STRENGTHS

GPU Performance Profiling	GPU Micro-architecture, Roofline, Occupancy analysis, Bandwidth analysis
AI and Deep learning	Transformers, PyTorch, Keras, Hugging Face, ONNX, Langchain
Software Engineering	Docker, Kubernetes, Kafka, PyTest, Copilot, JIRA, Git
Computer Vision	OpenCV, TorchVision, Decord, Scikit-image
Data Science	Pandas, Numpy, Matplotlib, Scikit-learn, SQL Alchemy
Devops	Github actions, Jenkins, Artifactory
Scripting	Bash, PowerShell, Python