Jinen Setpal

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EDUCATION

Purdue University   Aug. 2024 – Present
Doctor of Philosophy, Electrical & Computer Engineering   *West Lafayette, IN, USA*
Relevant Coursework: Optimization for Deep Learning, Machine Learning Theory, Deep Learning, Computational Optimal Transport & Deep Generative Models, Real Analysis & Measure Theory

PUBLICATIONS

Improving Feature Alignment in ConvNets using ContrastiveCAMs and Core-Focused Cross-Entropy   May 2025

Under peer review.   *Purdue University, USA*
- Derived *ContrastiveCAMs*, a provably faithful interpretability technique rendering attention maps for ConvNets in image classification tasks. ContrastiveCAMs breaks down the regions that contribute to class probabilities.
- Proposed an alignment-motivated constraint to ERM, called *Core-Constrained Risk Minimization* – this enforces only target relevant regions being used to inform predictions.
- Developed a classification-calibrated modification to cross-entropy as a surrogate for solving the constrained optimization objective, which learns to suppress non-target regions while extracting predictive performance.

BoilerBot: A Reliable Task-Oriented Chatbot Enhanced with Large Language Models   Oct. 2023

*2nd Proceedings of Alexa Prize TaskBot (Alexa Prize 2023). Hu, **Setpal**, et al.*   *Purdue University, USA*
- Fine-tuned quantized LLM adapters using QLoRA for task title augmentation & patching ASR failure modes.
- Extended Amazon's COBOT framework, integrating custom logic modules for constraint-based state management.

CutLang V2: Advances in a runtime-interpreted analysis description language for HEP data   Jul. 2021

Frontiers in Big Data, 4, 27. Ünel, Sekmen et al.   *CERN, Switzerland*
- Developed Interpreter Functions through lexical analysis using Flex & Bison (.cpp).
- Setup CI/CD Scripts w/ Automated Email Delivery using GitHub Actions & SendGrid.

WORK EXPERIENCE

Machine Learning Engineer   Jun. 2022 – Aug. 2024
DagsHub   *Tel Aviv, Israel*
- Developed PyTorch and TensorFlow dataloaders leveraging intelligent prefetching, automatic path-column and datatype detection, data streaming and automated tensorization towards the Data Engine.
- Developed a data streaming client by monkeypatching Python's `open()` and extending FUSE to lazily pull files from a specified remote using DagsHub's web APIs.

TRADE SECRETS

Semi-Supervised CAMs for Target Localization & Super-Resolution   Sep. 2021 – Apr. 2022
Final Presentation, TE AI Cup 2022. Setpal, et al.   *TE Corporate, UK*
- Won the **Best Innovation Award** for a custom neural architecture developed to classify minute differences.
- Implemented a latent feature aggregator network to minimize re-training for updating classification targets.

CONFERENCE PRESENTATIONS

The Machine Learning Angle for Open Source Science   25th Oct. 2023
The Linux Foundation Member Summit (LFMS) 2023   *Monterey, CA, USA*
Interpretability Tools as Feedback Loops   30th Nov. 2022
Toronto Machine Learning Summit (TMLS) 2022   *Toronto, Canada*

TECHNICAL SKILLS

Languages: Python, C, C++, x86 Assembly, Java, Kotlin, Bash, JavaScript, MATLAB, R, SQL, ROS2
Frameworks: PyTorch, JAX, TensorFlow, Keras, NumPy, Pandas, Pillow, ROOT, Matplotlib, FUSE, Node.js
Tools: Git, MLFlow, DVC, Docker, Radare2, Ghidra, TravisCI, GitGuardian, Kubernetes, Gazebo
Cloud Utilities: Google Cloud Console (Compute, Networking, Storage), Amazon Web Services (Redshift, ECR, ECS, S3, Sagemaker, CodePipeline, CodeCommit, CloudWatch, CloudFormation, Lambda), Azure Pipeline, GitHub Actions