Michael Lau

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SUMMARY

Researcher skilled in machine learning, software development and data analysis with Python. Ready to contribute clean, efficient code to build systems. Strong collaborator, communicator, and initiative-driven to enhance research efforts.

EDUCATION

Columbia University New York, NY
M.S. Electrical Engineering, Concentration: Machine Learning, GPA: 3.67/4.0 Feb 2023

Courses: Probabilistic Models and Machine Learning, Reinforcement Learning, Causal Inference 1 & 2, Natural Language Processing, Sparse Low-Dimensional Models, Statistical Learning, Deep Learning

University of Illinois at Urbana-Champaign Champaign, IL
B.S. (Hons) Computer Engineering, GPA: 3.58/4.0 May 2021
Honors: Dean's List (x2)

Courses: Machine Learning, Algorithms, Deep Learning in Hardware, Image and Video Processing, Artificial Intelligence, Digital Signal Processing, Data Structure, Computer Security, Audio Computing Lab, Abstract Linear Algebra

SKILLS

- Python, C++, C, PyTorch, TensorFlow, R, SQL, GCP, AWS, JavaScript, HTML, MATLAB, CSS, Assembly, Git, CAD, Docker, scikit-learn, SciPy, Pandas

WORK EXPERIENCE

Columbia University March 2023 - Present
Research Assistant - AI4VS Lab New York, NY

- Developing and proposing self-supervised learning for ophthalmology where labels are scarce, utilizing eye tracking data and OCT reports for robust predictions and representation learning.
- Leverage success in NLP to model eye tracking data based on BERT and Sentence-BERT to learn embeddings
- Creating and conducting experiments, processing data to train deep learning models; implemented SimCLR and DINO from scratch with PyTorch and PyTorch Lightning.
- Training, fine-tuning and validating Computer Vision models, leveraging domain knowledge from medical experts to guide model development, achieving 95% test-set accuracy in addition to improved interpretability

LatentAI Jun 2022 - Aug 2022
Machine Learning Engineer Intern Princeton, NJ

- Developed pruning methods on image recognition models using PyTorch, archived guaranteed 40% increase in inference speed on YOLOv5 Tiny.
- Designed experiments to test hypothesis on different pruning strategies to increase inference speed on edge devices.
- Programmed software tools in Python for standardized scalable deep learning experiments and; integrated pruning into LatentAI's end-to-end pipeline, benchmarking pruned models on target edge devices for the first time to assess inference time and accuracy.

LiveSensus Jan 2020 - May 2021
Co-Founder Champaign, IL

- Built a machine learning model and open-sourced dataset consisting of 30 hours of audio, labeled with MOS scores for quality estimation during Vo-IP.
- Designed and developed simulators to re-create quality degradation in both videos and audios for dataset and survey launched on AWS and LiveSensus website.
- Collaborated with four other founders, Professor Sanjay Patel and a leading live streaming company, five founders selected from 40 students under Alchemy Foundry at UIUC's Coordinated Science Laboratory.

PROJECTS

Vision Transformer for Glaucoma Classification using OCT Scans Dec 2022

- Proposed using Vision Transformer (ViT) for Glaucoma classification. Then use Latent Dirichlet Allocation (LDA) to interpret ViT's classification decisions on the neural network's attention weights across layers.
- Achieved 95% test-set accuracy with ViT; used attention rollout to combine per OCT scan heatmap of important regions; LDA discover representations used by ViT for classification.

Neural Causal Model for Image-to-Image Translation May 2022

- Designed and built a Neural Causal Model from scratch, consisting of deconvolution neural network and U-Nets trained as WGAN, for more robust conditional Image-to-Image translation.
- Trained Neural Causal Model with Cityscape Dataset, where the G-constrained architecture takes labeled image and a set of covariates that guides the translation of the image.