Sangwu Lee

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Education

University of Rochester | Anticipated May 2024 | Rochester, NY | 4.0/4.0 GPA

Majors: BS in Computer Science | BS Honors in Mathematics

Coursework: Artificial Intelligence, Computer Vision, Deep Learning, Linear Algebra

Machine Learning Projects

Pretraining ViT-VQGAN on anime dataset

- Implemented VQGAN with ViT encoder/decoder architecture in pytorch / JAX.
- Reduced training time by 4x using mixed precision, flash attention, and distributed training on multi-GPU environment.
- Released high-quality 2M anime art dataset to the open-source community.

Diffusion model training on Google TPU cluster

- Implemented state-of-the-art image generation such as Muse, MaskGIT, and MAGE.
- Deployed training TPUv3 cluster as part of Google's Tensor Research Compute program.

Neural Cellular automata [demo]

- Implemented neural cellular automata using JAX inside Google Colab environment.
- Deployed a working public demo on Vercel using tensorflow.js and SvelteKit.

Medical AI Experience

Human-Computer Interaction Lab | Research Assistant | 2018 – Present

- Developed an online AI screening tool for Parkinson's Disease which can provide diagnosis with 89% accuracy.
- Designed and developed a full-stack ML application integrating custom ML models in the backend. The backend was built using FastAPI, Docker, and GCP Cloud run. Frontend was built using React and Next.js.
- Expanded dataset collection site to 3x more locations and increased internal video dataset size by 5x.

Publications

- Using AI to measure Parkinson Severity at Home (npj Digital Medicine 2023) (Under Review)
- Detecting Parkinson's Disease Using a Web-Based Speech Task: observational Study (JMIR 2021)
- Humor Knowledge Enriched Transformer for Understanding Multimodal Humor (AAAI 2021) [Github]
- Integrating Multimodal Information in Large Pretrained transformers (ACL 2020) [Github]
- Facial expression based imagination index and a transfer learning approach to detect deception (ACII 2019)

Teaching and Leadership

- Frontiers in Deep learning (Undergraduate) | Teaching Assistant | 2023 Spring
- AI and Deep Learning for Healthcare (Graduate) | Teaching Assistant | 2019 Fall
- Idle Systems | Technical Lead | 2020

Skills and Interests

- Programming: Python (5 years), HTML/CSS/JAVASCRIPT (5 years), React (4 years), Svelte (1 year)
- Machine Learning: Pytorch (5 years), Pytorch lightning (2 years), JAX (2 years), tensorflow.js (3 months)
- Interests: Parallel training using data/model/operator parallelism, TPU training