OLIVER YUN

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EDUCATION

Carnegie Mellon University   Aug. 2023 − May 2027
B.S. in Computer Science   QPA: 4.00/4.00 (Dean's List)
Selected Coursework: Computer Systems, Parallel & Sequential Data Structures & Algorithms, Theoretical Computer Science, Machine Learning, Deep Learning.

SKILLS

- **Programming Languages & Tools:** Python, C, Java, React, Standard ML, Git, Unix.
- **Data Science & Machine Learning:** Numpy, Pandas, Matplotlib, PyTorch, CNN, LSTM, Transformers.

EXPERIENCE

Software Development Engineer Intern | *Amazon*   May 2025 − Aug. 2025
- Architected an end-to-end system integrating large language models for context-aware advertisement campaign ideation and creation, reducing average campaign setup time by 60%.
- Engineered a retrieval-augmented generation (RAG) pipeline to provide the model with real-time context (seasonal trends, holidays, product inventory) from internal APIs.
- Developed a React conversational UI to suggest timely campaigns (e.g., "Back to School"), dynamically adjusting recommendations in real-time based on product inventory.

Machine Learning Engineer Intern | *Glodon*   May 2024 − Jul. 2024
- Developed a novel representation of CAD sequences for input to a CAD generation transformer, resulting in 97% and 92% accuracy for sketch operation and curve type categorization, and 0.04 MSE for coordinate regression.
- Developed a transformer decoder-based network that, given a 2-dimensional sketch as input, generates sketch operations to construct the image as a CAD sequence.
- Created a comprehensive visualization tool using Matplotlib and Gradio to analyze a codebook of architectural models, enhancing the interpretability of complex data representations.

Competitions Director | *Carnegie Mellon Data Science Club*   Dec. 2023 − Present
- Implemented an automated stratified sampling matchmaking system for the AI Poker Competition using AWS DynamoDB and Lambda enforcing daily match limits while maintaining match history in PostgreSQL.
- Developed a match result handling system, integrating AWS SQS for real-time result processing and AWS S3 for match logging, enabling match streaming to front-end for interpretability of bot actions and match outcomes.

PROJECTS & RESEARCH

Feature Visualization for Mechanistic Interpretability | Github, Blog
- Investigated feature representation in AlexNet, providing evidence for the superposition hypothesis by identifying polysemantic neurons that activate for multiple, distinct concepts in a spatially-dependent manner.
- Developed a feature visualization pipeline in PyTorch with regularization (transformation robustness, color decorrelation) to synthesize inputs that isolate and reveal complex, superimposed features.

Contrastive Language-Image Pre-Training | Github
- Implemented Vision Transformer (ViT) component of CLIP model from scratch using PyTorch, including patch embedding, multi-head self-attention, and positional encoding for multimodal learning.
- Developed a PyTorch dataset implementation with data streaming, shuffle buffer management, image augmentations, and automated quality control, supporting efficient training on the 2 billion sample LAION dataset.

Bidirectional Auto-Regressive Transformer for Synopsis Generation | GitHub
- Fine-tuned a Bidirectional Auto-Regressive Transformer model to generate anime synopses based on genre inputs, leveraging the transformers library and PyTorch and achieving a cross-entropy loss of 0.023.
- Engineered a data process to tokenize a large dataset of anime genres and synopses, utilizing pandas for data manipulation and tokenization functions to handle variable-length inputs.