Peter Phan

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EDUCATION

University of Massachusetts Amherst — Amherst, MA
Master of Science in Computer Science — *Jan. 2024 – Dec. 2024*
- Cumulative GPA: 4.0/4.0

University of Massachusetts Amherst — Amherst, MA
Bachelor of Science in Computer Science, Double Major in Mathematical Computing — *Sep. 2020 – Dec. 2023*
- Cumulative GPA: 3.979/4.0

EXPERIENCE

Undergraduate Course Assistant — Amherst, MA
Teaching Assistant — *Jan. 2023 – Dec 2023*
- Assisted in course operations for Algorithms and Applications of Data Management courses
- Held weekly lectures, discussion sessions, and office hours
- Helped build course policies and material including assignment and exam problems
- Coordinated and participated in assignment grading and exam proctoring

Harvard-MIT Science Research Mentoring Program — Cambridge, MA
Research Intern — *Oct. 2019 – June 2020*
- Performed research based on Dynamics of Spinning Black-hole Binaries with Python
- Built simulations and graphs for merging blackholes
- Interpreted gravitational wave data from the Laser Interferometer Gravitational-wave Observatory
- Presented findings in a symposium at Harvard's Center for Astrophysics

Audible — Cambridge, MA
Software Engineering Intern — *Aug. 2019*
- Developed an Alexa Skill to recite haikus and iambic pentameters given key words
- Implemented an artificial intelligence system to generate unique poems for given structure and words
- Processed data from dictionary API to accumulate a comphrehensive and relavant set of vocabulary
- Practiced project management and development cycle as a software engineer under experienced mentors

PROJECTS

Towards Robust LLMs for Out-of-Distribution Medical NLP | *Research* — Sep. 2024 – Present
- Research project with the BioNLP Lab at UMass Amherst

Towards Scientific Discovery using LLMs via Bayesian Optimization | *Research* — Sep. 2024 – Present
- Research project with IESL at UMass Amherst

Ranking Games Meet Generative World Models for Imitation Learning | *Research* — Feb. 2024 – May. 2024
- Researched and built on SOTA research for offline inverse reinforcement learning
- Proposed an algorithm for offline reward learning through a maximum liklihood and cooperative game formulation
- Wrote and conducted experiments on robotic control tasks in MuJoCo and datasets in D4RL benchmark
- Authored a research paper documenting our methodology, experiments, and results

Linux Rice | *Lua, Shell, Unix* — June. 2020 – Aug. 2024
- Configured Arch, Debian, and Nix based distributions on Hyprland, AwesomeWM, and bspwm window managers
- Designed and developed custom command line scripts and widgets to control computer's hardware and apps
- Worked with various workflows in KVM, QEMU virtualization software, and WSL environments
- Developed a custom locally-hosted GPU powered LLM AI assistant with intuitive UI and backend support
- Created an IDE level Vim (Neovim) configuration in Lua

GraphPDF | *App development, Vite, Electron, Svelte, Typescript* — Feb. 2024 – May. 2024
- Built an modern Electron app for PDF organization, viewing, and annotating
- Developed key features such as an interactive graph view and dynamic search functionality
- Created an application architecture based on best practices for security and scalable development
- Implemented a workflow for cross-platform deployment

Quality Diversity for Texas Hold'Em | *AI Research*   Feb. 2024 – May. 2024
- Built a performative AI model for playing Texas Holdem Poker
- Implemented reinforcement learning models and training framework which promotes quality and diversed agents
- Achieved competitive results with an efficient agent against trivial and robust opponents
- Authored a paper documenting our approach, experiments, and results

Staying Consistent with GradCAM | *Neural Networks Research, Python, PyTorch*   Oct. 2023 – Dec. 2023
- Authored a comprehensive research paper summarizing our methodology, experiments, and findings
- Replicated and improved on results from other papers - including recoding an existing library for backpropagation
- Implemented a bespoke loss function, using the Gradient-weighted Class Activation Mapping (grad-cam) library
- Conducted thorough ablation study to optimize the interpretability of CNN and transformer architectures
- Compiled and analyzed test results, providing evidence that our method improves classification consistency

KanvasWire | *Web development, Git, Node.js, TypeScript, MongoDB*   Oct. 2022 – Dec. 2022
- Developed a custom template engine from scratch analogous to framework components such as Svelte and React
- Designed scalable microservices architecture to handle CRUD operations effectively with a MongoDB database
- Wrote comprehensive tests for testing microservices for intended user experience, consistency, and security
- Implemented secure authentication and managed session using JWT making sure to reduce risk of XSS attacks
- Developed a collaborative drawing canvas complete with creative tools and a live group chat

Emoji Doodler | *Machine Learning Research, Arduino, G-code, OpenCV, PyTorch*   Feb. 2022 – Apr. 2022
- Built a robot CNC printer robot powered by an arduino that used a cartesian to polar coordinates algorithm
- Calibrated motor drivers with G-code instructions
- Trained AlexNet, ResNet, and Vision Transformer deep learning models for facial sentiment classification
- Achieved near human accuracy (65%) on classifying human facial expressions with computer vision methods

TECHNICAL SKILLS

Programming Languages: Python, Javascript, TypeScript, Java, C/C++, Lua, SQL (Postgres), Nix
Developer Tools: Git, Neovim, Tmux, Docker, SSH, VS Code, IntelliJ, AWS, Eclipse, Slurm
Frameworks: DSPy, Astro, Svelte, GJS, React, Node.js, Next.js, Vue.js, Angular, Flask
Libraries: Jupyter, Matplotlib, NumPy, pandas, PyTorch, HuggingFace, Scikit-learn, TensorFlow, MLFlow, Optuna