

# Peter Phan

617-595-1034 | [ipeterphan@gmail.com](mailto:ipeterphan@gmail.com) | [linkedin.com/in/pkphan](https://www.linkedin.com/in/pkphan) | [github.com/pphan-sil](https://github.com/pphan-sil) | [pphan-sil.github.io/Portfolio](https://pphan-sil.github.io/Portfolio)

## EDUCATION

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### University of Massachusetts Amherst

Amherst, MA

*Master of Science in Computer Science*

*Jan. 2024 – Dec. 2024*

- Cumulative GPA: 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

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### Undergraduate Course Assistant

Amherst, MA

*Teaching*

*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*

*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 Internship*

*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 comprehensive and relevant set of vocabulary
- Practiced project management and development cycle as a software engineer under experienced mentors

## PROJECTS

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### 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

### When Ranking Games Meet Generative World Models for Imitation Learning

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 likelihood 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

### 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 diversified 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

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**Languages:** Python, Javascript, TypeScript, Java, C/C++, LaTeX, Lua, SQL (Postgres), HTML/CSS, Nix

**Developer Tools:** Git, Neovim, Tmux, Docker, SSH, VS Code, IntelliJ, AWS, Eclipse

**Frameworks:** Astro, Svelte, GJS, React, Node.js, Next.js, Vue.js, Angular, Flask

**Libraries:** Jupyter, Matplotlib, NumPy, pandas, Scikit-learn, PyTorch, TensorFlow, MLFlow, Optuna