Ivan Philip

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Education

Purdue University West Lafayette, IN

3.89/4.0 GPA, B.S. in Honors Computer Science, B.S. in Mathematics, Dean's List *Aug 2022 – May 2026*

Experience

Undergraduate AI researcher May 2024 - Present

RZ lab (Purdue University) *West Lafayette, IN*

- Reviewed Professor Ruqi Zhang's research work in the fields of differential privacy and sampling, going on to identify open questions in the field of differential privacy
- Studied diffusion models and the underlying literature
- Proposed and implemented novel methods to privatize diffusion models that allow preexisting models to be privatized on the fly rather than going through a retraining process.
- Currently researching similar methods to allow for copyright infringement avoidance on the fly.

Summer AI intern May 2023 - Aug 2023

Flow AI (Remote Native, Pre-Seed startup) *[Remote] Portland, OR*

- Worked directly with the CEO to launch the MVP and set up subsequent versions of the product
- Created methods of using user data/behavior and learning algorithms to streamline the client experience
- Created algorithms to remove junk contacts from a contact database

Digital Optometrist / Data Generation [Project Manager/Technical Lead] Oct 2022 – Present

Purdue University *West Lafayette, IN*

- Led students to create an AI model to detect eye diseases from a digital retinal image as well as an image taken by a phone
- Leading a small group in studying Generative Adversarial Networks, and novel image generation methods which we plan on using to supplement our phone camera based data set
- Looking into differentially private diffusion model fine tuning to allow for safe datasets to be produced for public use from sensitive private datasets.

Academic/Personal Projects

AI Powered Backtesting tool | *Python, SKLearn, Numpy, Yfinance, Pytorch* 2024

- Created a program that allows users to signal their trades for some outcome period
- Employed unsupervised learning techniques, including cosine similarity and K-means clustering, to identify and analyze recurring market patterns, aiding in the refinement of predictive models.
- Built GRU and Transformer models to predict price movements and used the backtester to get a deeper understanding of the model performances

Simple C Compiler | *Yacc, Lex, X86_64 assembly* 2023

- Created a compiler that uses a parse tree and simple logic to compile programs written in a limited version of the C programming language into assembly programs

Digital Optometrist | *Python, Tensorflow, Pytorch, Keras, NumPy* ONGOING

- Finetuned CNN backbones to help cope with small dataset sizes, allowing us to have a quick solution rather than waiting for data collection processes.
- Built multiple GAN's to help generate data, creating a system that made a new GAN for each data label allowing generated datasets to be automatically labelled and used out of the box rather than going through a manual labelling process.

Technical Skills and Certifications

Interests / Areas of study: Strong understanding of the underlying mathematical principles of machine learning from large models to the related linear algebra. Strong understanding of x86_64 Assembly and how to modify Assembly code to optimize programs. Good understanding of compiler internals and yacc
Languages: Java, Python, C, C++, JavaScript, HTML/CSS, x86_64 Assembly, MATLAB
Libraries / Frameworks: Tensorflow, Keras, Pandas, Pytorch, Numpy
Relevant Coursework: Object Oriented Programming (CS180), Multivariate Calculus (MA261), C Programming (CS240), Elementary Linear Algebra (MA351), Computer Architecture (CS250), Data Structures (CS251), Foundations of Analysis (MA341), Ordinary Differential Equations (MA366), Systems Programming (CS252), Data Mining and Machine Learning (CS373), Elements Of Complex Analysis (MA425), Compilers: Principles And Practice (CS352)