David Zhan

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Education

University of Pennsylvania Sept 2022 - Present

Bachelors of Science in Computer Science, Masters of Science in Computer Science *GPA: 4.0/4.0*

- **Minors**: Mathematics, Data Science
- **Coursework:** Algorithms, Operating Systems, Machine Learning/AI, NLP, Statistical Inference, Game Theory, Cloud Computing, Deep Learning, Distributed Systems
- **Involvements** Penn Aerial Robotics (Software Lead), Machine Learning Research @ Penn, Penn Club Soccer, Penn Club Badminton, Teaching Assistant

Professional Experience

Machine Learning Engineer Intern May 2025 – Present

Amazon — *PyTorch, AWS Bedrock/SageMaker/EKS/EC2, Kubernetes* *Sunnyvale, CA*

- Core AGI – focused on customizing Nova, Amazon's flagship LLM.
- Designed and deployed an end-to-end distributed distillation pipeline for pretraining data augmentation via batch inference, improving augmentation throughput by 30×.
- Leveraged the pipeline to run prompt engineering experiments with continued pretraining, developing a template that improved reasoning benchmarks (MMLU +0.3 pp, BBHCOT +2.6 pp, MATHCOT +0.8 pp, MMLUCOT +1.2 pp) with just 10,000 lines of augmented data without statistically significant degradation on general literacy metrics.

Software Team Lead August 2024 – Present

Penn Aerial Robotics — *Python, ROS2, PX4, OpenCV, C++* *Philadelphia, PA*

- Spearheaded the development of a computer vision payload detection algorithm for UAVs utilizing binary thresholding
- Developed internal position representation from drone camera using RANSAC and ROS2 integration

Software Engineer Intern June 2024 – August 2024

Ventoscity — *Flutter, NodeJS, Typescript, SQLite* *College Park, MD*

- Redesigned cross-platform mobile app using Flutter, achieving 20% faster load times and 30% smaller app size.
- Integrated AI-powered food scanning with 90% accuracy for portion sizes and fiber content analysis.
- Conducted extensive user testing with 100+ external participants implementing over 25 usability improvements, resulting in a 15% reduction in app crash rates.

Projects

News Source Classification Model — *BeautifulSoup, PyTorch, scikit-learn* May 2025

- Collected and cleaned **3,800+** headlines from Fox and NBC via BeautifulSoup-powered web scraping
- Built TF–IDF and word-embedding inputs for both single-channel and multi-channel TextCNN architectures
- Optimized hyperparameters to reach **82%** accuracy and **79%** F1-score—on par with a fine-tuned BERT baseline

Data Labeler — *React, Tailwind, FastAPI, Supabase, MEGA, AWS, Render* December 2024

- Dense captioning service to be used for training custom image models
- Implemented custom quality control, aggregation metrics; Amazon MechTurk for crowdsourcing data and crowd payment
- Captioned **400+** images, with a **210%** increase in words and **50%** in relevance compared to LLM generated captions

Blip — *Next.js, Tailwind, TypeScript, ConvexDB, Clerk, OpenAI, Cerebras* November 2024

- Short-form audio social media platform encouraging micro-learning during transition periods of the day
- Out of **500+** participants competing, winner of **PennApps XXV: Best Entertainment Hack**

Part-Of-Speech Tagger — *Python, numpy* September 2024

- Hidden Markov Model implementation using **Viterbi, Beam Search and Greedy** inference methods for POS tagging
- Using English Penn Treebank dataset for training; achieved a **96.3%** accuracy on randomized test set
- Model ranked top 2 in a 400+ graduate student class

Awards

Submission to Nature Medicine (Third Author) 2025

Smart Underwear: A Novel Wearable for Long-Term Monitoring Of Gut Microbial Gas Production Via Flatus

PennApps XXV: Best Entertainment Hack 2024

Skills

Languages: Python, Java, C, Swift, Dart, JavaScript, Typescript, SQL
Frameworks: React, NodeJS, NextJS, Tailwind, BootStrap, Flutter, FastAPI, Flask, Django
Tools: Docker, Kubernetes, AWS
Machine Learning: SageMaker, Bedrock, TensorFlow, HuggingFace, PyTorch