David Zhan

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Education

University of Pennsylvania May 2027

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

- **Minors**: Mathematics, Data Science
- **Coursework:** Machine Learning (NLP, CV, AI), Cloud Computing, Distributed Systems, Deep Learning
- **Involvements** Penn Aerial Robotics (Software Lead), Machine Learning Research, Penn Club Soccer, Teaching Assistant

Professional Experience

Software Engineer Inter May 2026 – August 2026

Google — *C++* *Waterloo, CA*

- Incoming Summer 2026 - Agentic Cloud Infrastructure

Machine Learning Engineer Intern May 2025 – August 2025

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

- Designed and deployed a fully automated distributed data-distillation pipeline on AWS SageMaker and EKS for large-scale pretraining augmentation, increasing augmentation throughput by **30x**
- Developed a reasoning-centric data-augmentation methodology leveraging teacher-student distillation via AWS Bedrock, yielding **+2.6 pp** BBH-CoT and **+1.2 pp** MMLU-CoT improvements on Nova, Amazon's flagship LLM, using only **10 K** curated samples.

Software Team Lead August 2024 – Present

Penn Aerial Robotics — *Python, ROS2, PX4, Gazebo* *Philadelphia, PA*

- Led development of autonomous UAV vision systems, including a payload detection pipeline leveraging binary thresholding and contour analysis for real-time onboard inference.
- Directed simulation and hardware-in-the-loop testing in Gazebo and PX4 SITL to validate autonomous flight performance.
- Competed at SAE Aero Design West 2025; placed **2nd place nationally** in advanced class with autonomous flight routines contributing to mission success.

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 10 usability improvements, resulting in a **15%** reduction in app crash rates.

Projects

Cloud Search Engine — *Java, AWS EC2, Distributed Systems* Dec 2025

- Implemented a **web server**, **distributed key–value store**, and a "mini-Spark" engine using only the `java.net` library
- Crawled and indexed **100k+ webpages** on an AWS EC2 instance, storing HTML content in a fault-tolerant KVS
- Developed end-to-end processing pipeline for **TF–IDF**, **PageRank**, inverted indexing scoring to support keyword search
- Achieved **sub-second query latency** for terms via table partitioning, caching, and optimized distributed job scheduling

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

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

Fine-tuned LSTM Sentiment Analysis Model — *numpy, pandas, scikit-learn* Dec 2024

- Trained an LSTM regressor on **336,239** rows of training data for ordinal classification of RateMyProfessor Reviews
- Performed data augmentation using synonym replacement and back-translation to achieve a **45%** longer data set
- Achieved a **12%** increase in Quadratic Weighted Kappa score, **15%** decrease average error in relative to pre-finetuning

Publications and Awards

Biosensors and Bioelectronics: X (Second Author) 2025

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

PennApps XXV: Best Entertainment Hack 2024

AIME Qualifier 2022

Skills

Languages: Python, R, Java, C++, JavaScript/TypeScript, SQL

Machine Learning: Deep Learning, LLMs, Transformers, Self-Supervised Learning, Data Augmentation, Model Distillation, Prompt Engineering, Evaluation, Experiment Tracking

Data & Pipeline Tools: NumPy, Pandas, BeautifulSoup, PySpark, Airflow, AWS SageMaker, AWS Bedrock, EKS, Docker

ML Infra & Deployment: batch/stream pipelines, Kubernetes, distributed training (multi-GPU), vector search (Chroma)

Backend & Full-Stack: Node.js, FastAPI, Flask, Django, React, Next.js

Cloud & DevOps: AWS (EC2, EKS, Lambda, S3, FSx), Docker, Kubernetes