NATHAN ZHU

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EDUCATION

Massachusetts Institute of Technology **Cambridge, MA**
Double S.B. in Computer Science and Math; Minor in Theater Arts | GPA: 4.7/5.0 Sep 2023 - May 2027
Coursework: Deep Learning, Natural Language Processing, Software Construction, Algorithms, Probability, Statistics, Computation Structures, Optimization Methods, Computational Cognitive Science

EXPERIENCE

Native Design | London, UK
Software Engineering Intern May 2025 - Aug 2025
- Shipped an ML-powered semantic search engine indexing 50+ TB of internal data using multi-modal embedding and vector similarity to enable meaning-based retrieval
- Developed a video analysis tool using ML-based pose estimation and movement classification to assess squat technique and deliver AI-generated feedback
- Designed and implemented a scalable ingestion pipeline linking HP's Clarity meeting assistant with Microsoft Copilot, enabling Copilot to access and analyze meeting data

Affective Brain Lab | Cambridge, MA
Software Engineering Intern May 2024 - Aug 2024
- Developed data pipeline to train an ML model for estimating the actionable, experiential, and intellectual utilities of website content
- Integrated model with a Google browser plugin and IOS application that provided search-time website analytics and generated summaries of personal browsing trends.

MIT Sports Lab | Cambridge, MA
Data Science Researcher Dec 2023 - May 2024
- Analyzed MLB pitcher datasets to assess how well players distinguish between low- and high-drag baseballs and how this impacts performance
- Built modeling pipeline to integrate legacy tracking data with modern systems, enabling more robust pitching analytics

PROJECTS

PokerBots Bot Jan 2024 - Feb 2024
- Programmed an autonomous pokerbot to solve Auction Hold'em, a poker variant, by utilizing Monte Carlo simulations as well as theories from statistics and psychology
- Awarded 700 dollar prize in the MIT Pokerbots competition for developing a bot with superior strategic capability

Strategic Pitch Sequencing in Baseball Sep 2024 - Dec 2024
- Utilized bayesian inference and Monte Carlo Markov Chains to model the thought process behind baseball pitch-sequencing (e.g., fastball-curveball-slider) based on factors such as previous pitch sequence, ball-strike count, and batter performance metrics
- Leveraged and analyzed online baseball data by extracting data from online databases (FanGraphs, Baseball Savant) to obtain key metrics, enabling a data-driven approach to understanding pitch decision-making

ACTIVITIES

MIT Varsity Swimming & Diving
Class Representative Sep 2023 - Present
- Conference runner-up in 200 Yard Butterfly and 100 Yard Butterfly

Student Government
Senior Class President; Sophomore and Junior Class Co-President Sep 2021 - May 2023
- Organized a Dance Marathon that raised over $85,000 for the University of Kentucky Children's Oncology Clinic
- Led a team of elected class representatives across three years to drive fundraising and strengthen campus community through large-scale events, including sunset picnics, diner nights, 5K runs, and tailgates

Waterford Summer Swim Club
Assistant Coach May 2021 - Aug 2023
- Coached 5 1.5-hour swim practices a week for the 6-9 and 10-12 age groups on neighborhood summer swim team
- Developed engaging workout plans and games for swimmers of a wide range of swim proficiency

SKILLS & AWARDS

Technical Skills
- **Tools and Languages**: Python [OpenCV, PyTorch/TensorFlow, pandas, NumPy, SciKit, NLTK], Git, C, SQL, WebPPL, Julia
- **Full-Stack Development**: HTML, CSS, JavaScript [Node.js/React/TypeScript], Python [Flask], PostgreSQL, Docker

Awards: 4x USA Swimming Academic All-American, Kentucky Journalism Association's Best Sportwriter Award