Zhihong (Cody) Jiang

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EDUCATION

New York University — **New York, NY**
M.S. in Computer Science (Merit Scholarship Recipient) — Expected Dec 2026
B.S. in Computer Science, Minor in Applied Mathematics, Minor in Game Design — Sep 2021 – May 2024

Elite Preparatory Academy — **Somerset, NJ**
Honor Class — Sep 2018 – May 2020

TECHNICAL SKILLS

Languages:
Python, C++, C#, C, SQL, Golang, Lua, Verilog, GML
Machine Learning / AI:
PyTorch, TensorFlow, Hugging Face Transformers, SpaCy, Torchaudio, XGBoost
Self-supervised learning (JEPA), CNNs, NLP pipelines
Data Science / Engineering:
Pandas, NumPy, Dask, PySpark, ETL, feature engineering, large-scale data processing
Web Development:
Frontend: *React, Vite, JavaScript, HTML/CSS*
Backend: *Flask, Express, Node.js, REST APIs, JWT*
Databases:
MongoDB, MySQL
Systems / Infrastructure:
Git, Docker, Linux
Static analysis, incremental/diff-based processing
Visualization:
D3.js, Vega-Lite, Matplotlib, Streamlit
Game Development / Graphics:
Unity, XLua (Lua–C# bridge), Godot, GameMaker, OpenGL

RESEARCH EXPERIENCE

Self-Supervised World Model (JEPA) for Sequential Prediction — **New York, NY**
NYU Deep Learning Course Research with Professor Yann LeCun — Sep 2024 – Dec 2024

- Owned the end-to-end implementation and training workflow for a self-supervised JEPA-based world model (inspired by LeCun, 2022) to predict future latent states for agent trajectory forecasting.
- Designed a recurrent JEPA variant that fused image sequences with action inputs, enabling the model to learn environment structure and dynamics rather than only short-term frame correlations.
- Diagnosed and mitigated representation collapse during training by testing and integrating regularization strategies (including VicReg and BYOL-style constraints), improving training stability and representation quality.
- Scaled training and evaluation on a dataset of **2.5M exploration frames**, building a repeatable pipeline for experimentation across dynamic two-room environments.
- Established probe-based evaluation scenarios (e.g., wall collisions, unseen layouts) to validate generalization and long-horizon prediction behavior beyond in-distribution trajectories.

CNN application in Cancer Diagnosis — **Boston, MA**
MIT Deep Learning Research with Professor Mark Vogelsberger — Jun 2021 – Aug 2021

- Contributed to the development of an AI-assisted cancer diagnosis application by integrating model inference, UI workflow, and NLP-based communication support into a single usable prototype.

- Built and trained a CNN-based classification component that reached **89% accuracy**, supporting core diagnosis functionality in the research prototype.
- Helped translate research output into a more deployable tool by improving usability and preparing onboarding/training materials for medical users.
- Supported research publication efforts (SPIE Digital Library) focused on practical integration of AI techniques in healthcare applications.

ENGINEERING EXPERIENCE

Gameplay / AI Systems Developer **New York, NY**
AbyssalPact (Unity, C#, XLua) Apr 2025 – Present

- Own the enemy AI systems architecture for a turn-based card game, delivering a hybrid **C# + XLua** runtime that supports strategy logic, card intent modeling, and iterative balancing without full engine-side rewrites.
- Built the core enemy-turn execution pipeline (scoring, legal target selection, summon placement, fallback handling) to improve runtime reliability and ensure turns resolve safely under edge cases.
- Designed an extensible AI Tag + metadata model (enum-based in C#, Lua-backed behavior mapping) to keep decision logic scalable as card count and mechanics expanded.
- Implemented runtime-configurable AI parameters (thresholds, loop limits, tag weights) through Lua/C# interfaces, reducing iteration cost for balancing and playtesting.
- Delivered compatibility shims and multi-strategy routing to support staged migration from legacy logic while enabling parallel testing of newer AI behaviors.
- Improved debugging and production stability through AI-specific logging, Lua/C# bridge safeguards, and re-entrancy protection, reducing failure risk during complex turn execution.
- Added simulation-oriented scaffolding to support future offline testing and planning-driven AI improvements, positioning the system for deeper evaluation workflows.

AI-Powered Interview Simulation Tool, Applied AI Tooling **New York, NY**
Engineering Assistant with Thomas Modern, Data Science Lead @ Meta Oct 2023 – Mar 2024

- Led core development of an interview simulation tool that combined NLP and audio analysis to evaluate response quality and provide structured feedback for users.
- Built and integrated model-driven analysis components using **Python, PyTorch, Transformers, Torchaudio, and SpaCy**, with a focus on practical scoring workflows rather than isolated model demos.
- Expanded system coverage by incorporating video-based nonverbal performance analysis and audio-based structure/terminology assessment into the evaluation pipeline.
- Improved usability and adoption by implementing user-facing features and documentation that made the tool easier to operate and interpret.

Anhui Yuntai Transportation Development Limited **Wuhu, China**
Software Engineering Intern Jun 2023 – Aug 2023

- Contributed to a mobile operations system for bus dispatch and car-rental management, helping digitize vehicle tracking and day-to-day operational workflows.
- Built a C++ data management module for routes, revenue, trip duration, and passenger flow, enabling more consistent operational reporting and downstream analysis.
- Supported route and operations analysis for business planning; optimization recommendations contributed to an estimated **15% efficiency improvement**.

SELECTED TECHNICAL PROJECTS

AI-Generated Code Technical Debt Analysis System **New York, NY**
Python, Dask, Git, Docker, Static Analysis, Visualization Sep 2025 – Present

- Designed and built an incremental, diff-based analysis system for multi-branch repositories to identify semantic drift, structural anomalies, and AI-generated code risk patterns at repository scale.
- Owned pipeline architecture from Git-history traversal through parallel analysis and caching, enabling repeatable processing across large commit histories instead of one-off scans.

- Implemented fault-tolerant caching and commit-delta execution to reduce turnaround time from **hours to minutes**, making the tool practical for iterative engineering use.
- Developed detectors for AI-specific debt patterns (e.g., duplication bursts, hallucinated APIs, dependency drift, unreachable code, over-abstraction) to improve signal quality beyond generic linters.
- Built backend support for Git time-travel and multi-branch lineage analysis over **millions of LOC / thousands of commits**, with interactive dashboards for hotspot and risk exploration.

NVIDIA Options Market Pipeline & Visualization **New York, NY**

Python, Pandas, D3.js, Data Engineering, Financial Systems Sep 2025 – Dec 2025

- Built an end-to-end options data pipeline and visualization system to transform raw chain data into analysis-ready signals for risk/behavior exploration.
- Processed **2M+ option-chain rows (2020–2022)** through ETL stages including normalization, moneyness/DTE bucketing, Greeks computation, and strike-distance modeling.
- Implemented data cleaning and join/type-normalization workflows to improve consistency across calls/puts and reduce downstream analysis errors.
- Designed interactive D3 visualizations for risk tradeoff, stability over time, and anomaly exploration, turning the dataset into a usable analytical interface rather than a static report.
- Added tooling to surface extreme behaviors (e.g., near-expiry volatility spikes, zero-gamma-like conditions) for targeted investigation.

Steam Review Radar — Platform Behavior & Signal Quality **New York, NY**

Large-Scale Data Science — NYU Big Data Project Sep 2025 – Dec 2025

- Built a large-scale review analysis pipeline to study helpfulness signals, manipulation patterns, and platform behavior in Steam review data.
- Developed helpfulness prediction models using **Negative Binomial regression** and **XGBoost**, comparing statistical and ML approaches for signal robustness.
- Implemented detection workflows for spam, duplication, and reviewer archetypes to improve interpretability of review quality patterns at scale.
- Designed signal-quality metrics to account for exposure bias and manipulation, shifting the project from raw prediction toward more reliable platform-level inference.

ADDITIONAL EXPERIENCE

Game Development Experience

- Built a custom C++ / OpenGL physics engine with volume-based collision handling and object-physics linkage, establishing a reusable foundation for interactive simulation and gameplay prototyping.
- Developed a Crazy Eights multiplayer card game (Node.js) with complete turn resolution logic, supporting rule-driven state transitions and reliable gameplay flow.
- Built a Pokémon-inspired top-down capture/battle prototype, implementing core exploration, encounter, and battle-loop mechanics for RPG-style gameplay experimentation.
- Recreated classic arcade gameplay mechanics with collision and event systems, focusing on responsive interactions and stable game-loop behavior across prototypes.
- Maintained an itch.io portfolio with multiple playable prototypes, packaging and publishing iterative builds for external playtesting and showcase use.

Web & System Projects

- Built an **Anonymous Course Reviews Platform** (**MongoDB, Express, Node.js**) to support submission and retrieval workflows for user-generated content, with backend APIs structured for future moderation and feature expansion.
- Developed a **Task Manager** (**Express, Handlebars**) with CRUD workflows and application-state handling, emphasizing backend routing, template rendering, and user-facing task operations.
- Built an **Airline Ticket Booking System** (**SQL, Flask**) with relational schema design and booking-related backend flows, focusing on data consistency and end-to-end query integration.
- Built **Kindly RemindMe**, a JWT-authenticated time-capsule messaging platform with **CRON-based scheduling**, delivering timed message workflows and secure user/session handling.

AI / Machine Learning Projects

- Built a Sentiment & Toxicity Classification App (BERT, Streamlit) that packaged transformer-based inference into an interactive interface for rapid text analysis and demonstration use.
- Implemented a CEO approval statistical estimation project to model and evaluate approval trends using applied statistical inference workflows.
- Built an NYC bicycle traffic modeling pipeline using Poisson modeling + MLE to estimate event-rate behavior in count-based urban traffic data.
- Implemented an M/M/1 queue simulation for API endpoint behavior analysis, modeling service/load dynamics and queue-performance characteristics under varying conditions.
- Implemented Gaussian parameter estimation via gradient descent, translating statistical estimation into an optimization-based workflow for numerical experimentation.
- Built probability sequence simulations (conditional events) to analyze event dependencies and reinforce probabilistic reasoning through computational experiments.

COMPETITIVE & ACADEMIC ACHIEVEMENTS

- **National Olympiad in Informatics:** Silver, Silver, Gold medalist
- Active in **weekly competitive programming**, performing at approximately **Top 10%** level
- Participanted in **NYU LeetCode** and **Data Science Bootcamp** programs

SELECTED COURSEWORK

Object Oriented Programming · Game Programming · Game Design · Games and Players · AI for Games · Artificial Intelligence · Machine Learning · Deep Learning · Algorithmic Machine Learning and Data Science · Data Analysis · Big Data · Information Visualization · Databases · Software Engineering · Web Development · Operating System · Human Computer Interaction · Design & Analysis of Algorithms · Digital Logic and State Machine Design