Neil Kumar

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EDUCATION

The University of Chicago — Chicago, IL
B.S. in Computer Science & *B.A.* in Astrophysics — Expected, June 2026

Harrow School — London, UK
A-levels in Physics, Maths, Further Maths, Economics — September 2016 — August 2021

SKILLS

- Programming Languages: Python | C | HTML/CSS/SASS | JavaScript | Java | SQL | R | Git | Linux | Swift
- Technologies: PyTorch | TensorFlow | Docker | Apache | React | SQLite |Vim
- Languages: Portuguese (Proficient)

EXPERIENCE

Outlier AI — San Francisco, CA
Software Engineer Intern — June 2024 – Present

- Achieved a 95% accuracy rate in coding tasks by implementing rigorous testing protocols and code review practices, completing projects in 30% less time than the average developer on the team. Selected as one of ten for a promotion to the reviewer position and inclusion in the Oracle (high-performance) team.
- Spearheaded an innovative technique of comparing two model responses side by side instead of analyzing one at a time, which accelerated the model training process by 25% and improved assessment accuracy by 15%.
- Collaborated with a team of 12 hand-picked candidates on the implementation of the Google_Flights API tool to enable multi-city flight searches, expanding the tool's capabilities and improving user experience by providing more comprehensive travel options.

Fermi National Accelerator Laboratory — Batavia, IL
Researcher and Software Engineer Intern — June 2023 – May 2024

- Developed a Simulation-Based Inference algorithm that automatically infers parameters (e.g., number of lensing/source galaxies and Einstein radii) from images of deeply-lensed galaxy clusters at a 95% accuracy rate, processing complex data more efficiently.
- Designed a Python script that can generate over 1,000,000 realistic simulations of lensed galaxy clusters, reducing the analysis time from months to hours, thereby accelerating research timelines significantly.

Inertia LLC — Atlanta, GA
Co-founder and Full-Stack Developer — June 2022 – Present

- Developing (currently in beta testing) a multifunctional application that not only enables users to track their workouts but also operates as an intelligent assistant, recommending workout plans tailored to individual goals.
- Implemented a user interface that facilitates the creation of personalized workout regimes based on user data.

Cold Spring Harbor Laboratory — Long Island, NY
Researcher and Machine Learning Engineer — June 2022 – June 2023

- Investigated the olfactory cortex of fruit flies, translating biological neural network mechanisms into a novel artificial neural network model, which bridges the gap between biological understanding and AI technology.
- Developed a two-layer neural network architecture inspired by fruit fly associative learning, which reduced catastrophic forgetting in continual learning by over 20%, pushing the boundaries of current machine learning models.
- Performed extensive empirical testing on benchmark datasets, achieving a 15% improvement in memory retention over existing neural-inspired algorithms, contributing to the advancement of machine learning research.

Feinstein Institute for Medical Research, Northwell Health — Long Island, NY
Researcher, Bioinformatician — June 2022 – June 2023

- Conducted molecular biology experiments that uncovered the pathogenesis of Trypanosoma in human cells, providing critical insights that inform potential treatment pathways and contribute to the broader understanding of the disease.
- Engineered and deployed bioinformatics algorithms to model molecular docking, demonstrating Metformin's therapeutic potential on neural tissues; findings contributed to 3 new research proposals focusing on brain health preservation strategies.

Projects

Go Game Development and AI Integration

- Integrated Game Logic with Interfaces: Successfully integrated the core game logic of Go with both graphical user interface (GUI) and text-based user interface (TUI) components, enabling seamless gameplay across different platforms.
- Implemented advanced strategies for the AI bot, achieving a win rate of over 70% in simulated games. This included adding command-line parameters for flexible gameplay configurations.
- Extended the game to support up to nine players in both GUI and TUI, ensuring proper functionality and visual distinction for each player's pieces using different colors or labels.

Premier League Data Visualization

- Utilized D3.js to build interactive visualizations with tooltips and dynamic updates, improving comprehension of significant data changes.
- Created three paired visualizations showcasing hallucinators, confusers, and jumblers using Premier League data, emphasizing the importance of data integrity, unambiguity, and visual-data correspondence.
- Designed effective visualizations to highlight and correct misleading representations, including stacked bar charts, line plots, and radar charts, ensuring accurate and clear data interpretation.