

Nicolas Kim

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EDUCATION

Brown University

Providence, RI

Sc.B Applied Math - Computer Science (GPA: 4.0/4.0)

Sept. 2022 - Expected May 2026

- Relevant Coursework: (Graduate) Deep Learning, Computer Systems, Databases, Software Engineering, Data Structures & Algorithms, Convex Optimization, Statistical Inference I/II, Linear Algebra, Multivariable Calculus

TECHNICAL SKILLS

Programming Languages: Python, SQL (MySQL), Java, HTML/CSS, JavaScript, TypeScript, C/C++

Frameworks/Software: React.js, Firebase, Google Cloud, Flask, RESTful API, Docker, Tensorflow, PyTorch

EXPERIENCE

National Institutes of Health

May 2024 – Present

Machine Learning Engineer Intern

Bethesda, MD

- Constructed and fine-tuned deep learning models (CNN, RNN, Bert) for faster and more accurate inference of edit distance between DNA sequences, reducing mean squared error rates from 7% to 2% compared to baselines.
- Beat runtime of state-of-the-art platforms using hashing algorithms by 1.2x by storing embeddings in a DuckDB MySQL vector database and conducting a nearest neighbor search for user queries for >1 million sequences.

Singh Lab at Brown University

Mar. 2023 – Present

Deep Learning Research Intern

Providence, RI

- Optimized CNN models for predicting gene expression from biological assay data by using transfer learning, achieving a test accuracy of 92% and beating baselines (Random Forest, SVM, XGBoost) by at least 18%.
- Extracted features driving model predictions using gradient-based input optimization, correlating 3 histone marks for high gene expression predictions and 2 with low gene expression, validating previous experimental studies.

Yajima Lab at Brown University

Jun. 2023 – Apr. 2024

Bioinformatics Software Engineer Intern

Providence, RI

- Constructed pipeline integrating DEXSeq and MISO software for bulk RNA-seq statistical analysis, identifying and visualizing 1000+ previously unidentified candidate genes in R for downstream validation by the wet lab.
- Automated pipeline deployment by writing 10+ shell scripts for execution, containerizing dependencies in Docker, and parallelizing execution on an HPC cluster.

PROJECTS

Transforming SAR

May 2024

Python, Tensorflow

- Designed end-to-end pipeline for identifying humans in 500+ SAR operation images using Vision Transformers.
- Adapted DETR Vision Transformer to do set-based bounding box prediction, using custom multi-component loss function (L1, GIOU) and prediction-to-ground truth matching. Improved R^2 from 0.45 to 0.65.

Music@Brown

Nov. 2023 - Dec. 2023

JavaScript, Firebase, React.js, Tailwind CSS

- Created full-stack web application connecting upcoming artists at Brown to other Brown students.
- Integrated Spotify API for user-artist matching based on preferred genres, unit-testing functionality with Jest.
- Led the implementation of storing artist/user login information into a backend noSQL database (Firestore).

WeensyOS

Apr. 2024

C/C++

- Implemented kernel and process isolation in a toy OS, implementing shared and read-only memory, forking and exiting, virtual page allocation, and overlapping virtual address spaces.

COMMUNITY & LEADERSHIP

Hack@Brown Team Lead

October 2022 – Present

Workshops Team Lead

Providence, RI

- Spearheaded development of workshop series for 300+ hackathon participants, organized weekly meetings for 10+ workshop members, presented workshop on deep learning basics and AI ethics with 50+ attendees.