Abi Kakolla

Toronto, ON | 647-957-7403 | kakolla@usc.edu | linkedin.com/in/kakolla | kakolla.com

Education

University of Southern California — Los Angeles, CA
Bachelor of Science in Computer Science (GPA: 3.71) — *Aug 2023 – Dec 2026*
Hackathons: HackHarvard (Harvard), LAHacks (UCLA), HackSC (USC), CalHacks (Berkeley)

Experience

Machine Learning Researcher — Aug 2023 – Present
USC Center for Neural Engineering — *Los Angeles, CA*

- Modeled in-silico layers of the Hippocampus used to generate a dendritic tree as part of a neural network using MeshLab and Python
- Developed open-source software to grid a dataset of 6 million neural points that enhanced the neural mesh model resolution by 348%, enabling other teams to create more accurate models and save on computational costs
- Reduced neural network generation by 75% by integrating unsupervised machine learning algorithms, enabling faster simulations
- Currently developing a Hybrid Retrieval-Augmented Generation (RAG) pipeline for research faculty integrating LLM agents with Neo4j, LangChain, and Pinecone for paper querying

VR Game Development Intern — Feb 2025 – Present
FoundrySix (partnered with Meta) — *Los Angeles, CA*

- Exploring Data-oriented program design in Unity to optimize memory usage with 1000+ entities on-screen on the Meta Quest 3S
- Scripting new levels and characters for playtesters with C#
- Contributing to codebase of 50K+ lines of code

Lead Software Developer — Nov 2021 – June 2022
inLoop (sponsored by Deloitte) — *Toronto, ON*

- Led a team of 3 developers to design and build a website using JavaScript, HTML, and CSS, that "gamified" news consumption among teens in Toronto
- Implemented a Firebase database for website analytics, driving data-driven decision-making that increased user engagement by 200% and attracted 400 weekly visitors within two weeks
- Enhanced UI/UX improvements using Figma while working with the marketing department

Projects

Clean Sweep – Harvard Hackathon Winner | *Python, OpenCV, Terraform, Databricks* — Link

- Placed as one of the winners out of 140 teams across North America at Hack Harvard for best use of Terraform
- Developed a smart city waste management platform with a team of 4 that optimized collection routes for sanitation trucks
- Wrote the image contour algorithm using OpenCV to detect real-time trash levels and sent data via a REST API to a Raspberry Pi server
- Implemented a Random Forest Classifier model in Databricks using Google Kubernetes Engine resources to make predictions using the real-time data. Integrated these predictions into a React frontend, displaying optimal routes to the user (truck drivers)

Genetic Optimization Algorithm | *C++, React, TypeScript, Node.js, WebSockets* — Link

- Designed a heuristic genetic optimization algorithm in C++ that uses Uniform Chromosome Crossover to develop higher-fitness solutions for target images and text
- Built an interactive frontend with React and TypeScript, integrating with backend via a WebSocket
- Enabled real-time hyperparameter tuning (e.g. mutation and survival rates) through an intuitive UI to improve algorithm performance

Technical Skills

Languages: C++, C, Python, C#, Java, Lua, JavaScript, TypeScript, HTML/CSS, SQL, Cypher
Frameworks: React, Next.js, Node.js, Flask, Tailwind, NumPy, Scikit-learn, Pandas, TensorFlow, Keras
Developer Tools: Git, Docker, Kubernetes, GCP, VS Code, Eclipse, Linux (Debian)
Other: Arduino (ATmega328), Solidworks, MongoDB, Pinecone, Neo4J, LangChain