KARTIK SINHA

ksinha45@gatech.edu ⋄ linkedin.com/in/kartik-sinha-gt/ ⋄ kartikyz.github.io ⋄ github.com/kartikyz ⋄ (470)·833·0971 ⋄ US Citizen

EDUCATION

Georgia Institute of Technology　　　　　　　　　　　　　　　　　　　　August 2020 - 2024
B.S./M.S. in Computer Science　　　　　　　　　　　　　　　　　　　　　　　　　　*Atlanta, GA*

GPA: 4.00, Faculty Honors
Specialization: Machine Learning, Systems and Architecture
Courses: ML, CV, Algorithms Analysis, Compilers, Automata and Complexity Theory, Operating Systems

WORK EXPERIENCE/RESEARCH

Amazon Web Services　　　　　　　　　　　　　　　　　　　　　　　　　May 2023 - July 2023
Software Development Engineer Intern, AWS Cryptography – Secrets Manager　　　　　　　*Seattle, WA*

· Implemented and deployed new APIs for an AWS-critical internal service to manage secrets on a distributed system deployed to every AWS host, reducing customer tickets by 90 percent and 4 manual operations hours per week.
· Built APIs using Java Spring with Mockito unit tests and integration tests. Built rate-limiting mechanism to handle large scale traffic (1M+ hosts). Extended Perl CLI and integrated internal IAM service to automate verification.

Embedded Pervasive Lab, Georgia Tech　　　　　　　　　　　　　　　August 2022 - Present
Student Research Assistant, UROP, College of Computing　　　　　　　　　　　　　　　*Atlanta, GA*

· Researching scheduling methods for DAG workloads and function invocations to design an edge-native FaaS system meeting edge resource constraints and latency-critical objectives in a geo-distributed environment.
· Conducting literature review (2-3 papers/week) and building experimentation atop OpenFaaS.
· Benchmarked transfer-learning ML models on edge cluster comprising RaspPis and Google Coral TPU accelerators.

Amazon　　　　　　　　　　　　　　　　　　　　　　　　　　　May 2022 - August 2022
Software Development Engineer Intern, Amazon Ops Finance – Fusion　　　　　　　　　　*Seattle, WA*

· Delivered an end-to-end scalable native-AWS system prototype for financial report-generation (100+ pages), collating multiple financial and BI data ingestion sources (Redshift, SQL, etc.) for org-wide use (20+ teams).
· Implemented cross-team real-time collaboration using CRDTs and WebSockets. Used NodeJS, DynamoDB, IAM, STS, Fargate, S3, and the AWS CDK.
· Deployed internally to Beta. Presented to stakeholders, senior engineers, and an Amazon Finance VP.

College of Computing, Georgia Tech　　　　　　　　　　　　　　　January 2022 - Present
Undergraduate Teaching Assistant, Project Lead　　　　　　　　　　　　　　　　　　*Atlanta, GA*

· Taught CS 3510 Algorithms Analysis and CS 2110 Computer Org. and Programming (digital logic, assembly, C).
· Managed teams of 5 TAs as Project Lead to create, revise, and course projects on Java, C, and assembly test suites for a course of 500+ students.
· Taught twice-weekly 1.5 hour labs to 50+ students, held office hours, received Thank-A-Teacher awards.

PROJECTS/LEADERSHIP

Office Hours Booking System　　　　　　　　　　　　　　　　　　　　May 2022 - Present
Founder and Team Lead, Student Government Association IT Board, Georgia Tech　　　　　*Atlanta, GA*

· Pitched to and secured funding from SGA leadership to create a unified cross-course queueing system for the College of Computing to improve existing office-hours and course administration logistics.
· Kickstarted a new project, interviewed other students to recruit 8 team members. Led software development, working directly with leadership, course staff and project team.
· Used Websockets, AWS Lambda for SSO and backend service, DynamoDB, with frontend hosted on S3.

Song Transformer　　　　　　　　　　　　　　　　　　　　　　　　January - May 2023
CS 7643 Graduate Deep Learning Final Team Project　　　　　　　　　　　　　　　　　*Atlanta, GA*

· Created an ML music generation pipeline by tuning and re-training 4 open-source ML models to take in as inputs a song and voice sample and reproduce a new song in the target voice. Wrote a paper in CVPR format with results.

· Used Demucs for waveform domain source separation to separate music and vocals. Used Spotify's U-Net and attention-based BasicPitch model for audio music transcription. Processed MIDI using Google's transformer-based model for music generation. Recombined resulting track with the SoftVC VITS SVC model's results.
· Used FFT convolutions to calculate cross-correlation between original and output tracks for similarity metrics.

Graph Algorithms Animations Visualizer   May 2021 - July 2021

· Created website using React and TypeScript to visualize animations of algorithms for directed/undirected and weighted/unweighted graphs. Hosted on GitHub Pages.
· Allows users to build custom graphs or use random graphs or network/grid graphs. Implemented animations for depth-first search and breadth-first search algorithms.

Spotify Song Recommender System   December 2020

· Group project to create an ML model to recommend new songs to users based on their playlists.
· Implemented Python client to call Spotify APIs to retrieve song attributes. Created rate-limit handler to reduce data-collection time by 60x. Implemented a response-parser and compiled the resulting dataset (1M+ examples with 20+ features).
· Used K-means clustering and nearest-neighbors approaches, attaining qualitatively similar recommendations.

Neural Network Library   July 2020

· Programmed a feedforward neural network library in Python from scratch using only NumPy and Matplotlib. Implemented the SGD algorithm with Logistic Loss and MSE error functions and sigmoid, ReLU, tanh activation functions.

TECHNICAL SKILLS

Languages	Java, Python, C/C++, TypeScript, JavaScript, Assembly, HTML/CSS, Perl, Bash
Frameworks	AWS services, NoSQL, SQL, PyTorch, scikit-learn, Pandas, Tensorflow, gRPC, Node.js
	Git, Docker, UNIX, React, Flutter