Neel Gupta

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EDUCATION

University of Southern California   **Los Angeles, CA**
B.S. Computer Science, Minor: Mathematics, GPA: 3.6/4   *August 2021 - May 2025*
Programming Coursework: Parallel & Distributed Computing, Algorithms, Distributed Systems
Math Coursework: Applied Probability, Real Analysis, Math of Physics & Engineering II
Honors and Societies: Viterbi Dean's List, ACM, IEEE, Alpha Lambda Delta, Scope

WORK EXPERIENCE

Undergraduate Research Assistant   **Los Angeles, CA**
USC Ming Hsieh Department of ECE - FPGA/Parallel Computing Lab   *April 2023 - Present*
– Boost cache coverage by over 30% via optimized, cutting-edge ML-based prefetching techniques (Reinforcement Learning, Product Quantization, Knowledge Distillation), in order to minimize CPU stalling.
– Craft sophisticated ML-based prefetching techniques utilizing PyTorch, cuDNN, scikit-learn, and C, seamlessly incorporating them into a microarchitecture simulation framework, ChampSim.
– Conducted research to bridge the gap between theory and practice, demonstrating how ML-based prefetching techniques can be pragmatically implemented for real-world systems.

Undergraduate Research Assistant   **Marina del Rey, CA**
USC Information Sciences Institute - STEEL: Security Research Lab   *May 2022 - January 2023*
– Automated F1 score calculation using bash and NumPy, helping improve hyperparameterization in the PCA algorithm for anomaly detection in network traffic data, resulting in an increase in F1 by 15%.
– Leveraged the Enron Corpus dataset to annotate 2.5K emails, training state-of-the-art Attention-based NLP Transformer models, proficient at identifying and categorizing spam and phishing content.

PROJECTS

Lendly - Trade, Lend, Wear, Share   Link to Codebase
– Engineered a high-performance, multithreaded REST API utilizing Spring Boot and Maven, while conducting validation of the backend using Postman to ensure robust functionality and reliability.
– Developed a responsive React frontend with CSS, leveraging Node.js for package management, utilizing hooks for state persistence and data refreshing, and seamlessly managing CORS with a backend proxy.
– Implemented streamlined deployment, auto-scaling, and reliable data storage using Google Cloud App Engine, Google Cloud SQL, and a GitHub Actions pipeline for continuous integration and deployment.

Handwritten Digit Recognizer   Link to Demo
– Developed a high-accuracy machine learning system for handwritten digit recognition using Python, TensorFlow, Keras, and a 2D Convolutional Neural Network architecture trained on GPGPU platform.
– Utilized TensorFlow.js, GitHub Pages, and Jekyll to successfully deploy a machine learning model, enabling the recognition of handwritten digits through an HTML frontend interface.

SKILLS

Programming Languages:	C++, Python, Java, JavaScript
Web Development:	React, Angular, Express.js, Next.js, Node.js, HTML, CSS
Databases:	MySQL, MongoDB, Redis, Firestore
Cloud Technologies:	Docker, Kubernetes, Google Cloud Platform (GCP), AWS Lambda, S3, EC2

PUBLICATIONS

[1] Neelesh Gupta, Pengmiao Zhang, Rajgopal Kannan, and Viktor K. Prasanna. "PaCKD: Pattern-Clustered Knowledge Distillation for Compressing Memory Access Prediction Models". In: *IEEE High Performance Efficient Computing (HPEC)*. IEEE. Boston, MA, Sept. 2023.

[2] Jeffrey Liu, Rajat Tandon, Uma Durairaj, Jiani Guo, Spencer Zahabizadeh, Sanjana Ilango, Jeremy Tang, Neelesh Gupta, Zoe Zhou, and Jelena Mirkovic. "Did your child get disturbed by an inappropriate advertisement on YouTube?" In: *Proceedings of KDD Undergraduate Consortium*. KDD-UC'22. ACM. Washington, D.C., Oct. 2022.