

# NIRVEK PANDEY

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## Education

<b>University of California San Diego</b> <b>B.S. in Computer Science, Regents' Scholar</b>	<b>La Jolla, CA</b> September 2022 – December 2026
<ul style="list-style-type: none"><li><b>Fundamentals:</b> Object Oriented Programming, Advanced Data Structures, Computer Security, Theory of Computation, Design and Analysis of Algorithms, Software Engineering, Database Systems</li><li><b>AI/ML:</b> Search &amp; Learning Algorithms, Modeling, Deep Learning, NLP, Recommender Systems and Web Mining</li><li><b>Systems:</b> OS, Networked Services, Parallel Computing, Graduate OS, Data Center Systems, Wireless Systems</li></ul>	

## Experience

<b>Data Science Intern</b> <a href="#">Newton(Neurolens)</a>	<b>Costa Mesa, CA</b> June – September 2024
<ul style="list-style-type: none"><li>Collaborated with data architects to implement an ETL system using SQL and Azure Pipelines, separating analytics workloads that improved pipeline reliability by 27% and accelerated R&amp;D analysis.</li><li>Built an ML pipeline with OpenCV and PyTorch to detect suppressed eye-tracking signals with 84% accuracy in identifying suppressed measurement and enabling more reliable data interpretation for optometry research.</li><li>Created data visualizations utilizing Matplotlib and Seaborn to illustrate the impact of architectural updates.</li><li>Influenced stakeholder decisions to invest in regression-based modeling for next-generation device development.</li></ul>	
<b>Software Engineering Intern</b> <i>UC San Diego</i>	

## Projects

<b>Personal Portfolio Site</b> <i>Next.js, Go, Firebase, PostgreSQL, Google Cloud Run</i>	January 2025 – Present
<ul style="list-style-type: none"><li>Upgraded full-stack portfolio from static React to Next.js + Go microservice architecture, implementing SSR, batched loading, and CDN/CMS caching to achieve 90% fewer API calls and 300% faster load times.</li><li>Integrated Google Drive API for dynamic, location-tagged content management, enhancing personalization while maintaining high availability through automated CI/CD with Docker, GitHub Actions and Vercel.</li></ul>	
<b>Research - OS Performance Analysis</b> <i>Linux, C, ARM64, Python</i>	
<ul style="list-style-type: none"><li>Developed low-level benchmarking suite in C for ARM architecture testing CPU scheduling, memory hierarchy, TCP/IP protocols, and file system I/O performance across multiple operating system layers.</li><li>Quantified storage bottlenecks by measuring a 500x latency spike for disk-based page faults and identified a 6.4 GB file buffer cache limit using pointer chasing to map the L1/L2/L3 cache and DRAM hierarchy.</li><li>Benchmarked network performance using ping, ethtool, and custom socket programs, discovering an 8x latency penalty for remote file access over WiFi compared to local disk operations.</li></ul>	
<b>TritonTube</b> <i>Go, SQLite, gRPC, etcd, AWS EC2, FFmpeg, MPEG-DASH, HTTP</i>	
<ul style="list-style-type: none"><li>Engineered fault-tolerant video platform with RESTful APIs for upload/playback, implementing MPEG-DASH adaptive streaming to optimize video quality and reduce buffering by over 50% across varying network conditions.</li><li>Built scalable metadata and content services on AWS EC2 with etcd-backed <b>RAFT</b> consensus protocol, ensuring data consistency and high availability while supporting 100+ concurrent users for video processing workloads.</li></ul>	
<b>Research - RedShift</b> <i>CUDA, HuggingFace, Ollama, Prompt Engineering</i>	
<ul style="list-style-type: none"><li>Extended the "<b>Distract LLMs for Automatic Jailbreak Attack</b>" framework by integrating chain-of-thought prompting and FastChat support, expanding attack coverage by 67% across 2,000+ attacks and 50 adversarial prompts.</li><li>Enhanced an ML orchestration pipeline with LLMs as attackers, defenders, and judges; standardized adversarial datasets using custom PyTorch scripts for consistent benchmarking, tracked with WandB.</li></ul>	

## Skills

<ul style="list-style-type: none"><li><b>Programming Languages:</b> Python, Go, Java, JavaScript/TypeScript, C, C++, SQL, HTML, CSS</li><li><b>Libraries &amp; Frameworks:</b> PyTorch, NumPy, Pandas, Matplotlib, TensorFlow, Scikit-Learn, OpenCV, React, Next.js, Angular, Express.js, Node.js, Flask, Tailwind CSS, JUnit, Jest, Puppeteer, FFmpeg</li><li><b>Tools &amp; Technologies:</b> Git, Docker, gRPC, etcd, Kubernetes, PostgreSQL, SQLite, MongoDB, Supabase, Firebase, Redis, GCP, Google Cloud Run, Vercel, Azure Pipelines, AWS EC2, AWS S3, WandB, CUDA, OpenCL, MPEG-DASH, GitHub Actions, Linux, SharePoint, Excel, PowerPoint, BLE, WiFi, LoRA, Zigbee</li></ul>
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