Nirvek Pandey

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Education

University of California San Diego **La Jolla, CA**
Regents Scholar, Computer Science B.S. Sept 2022 - June 2026
Relevant Coursework:

- **Core Computer Science:** Object Oriented Design, Computer Organization, Advanced Data Structures, Discrete Mathematics, Design and Analysis of Algorithms, Software Engineering
- **Artificial Intelligence & Machine Learning:** Search & Reasoning, Probabilistic Models, ML: Learning Algorithms, Deep Learning, Natural Language Processing, Recommender Systems & Web Mining
- **Systems & Parallel Computing:** Operating System Principles, Networked Services, Parallel Computing

Skills

Programming Languages: Python, Go, Java, JavaScript/TypeScript, C++, SQL, HTML, CSS
Libraries & Frameworks: PyTorch, TensorFlow, Scikit-Learn, NumPy, Pandas, Matplotlib, Seaborn, OpenCV, TSFresh, React, Next.js, Express.js, Node.js, Flask, Socket.io, Tailwind CSS, JUnit, Jest, Puppeteer, FFmpeg
Tools & Technologies: Git, Docker, Firebase, Google Cloud Run, SQLite, MongoDB, Vercel, Azure Pipelines, AWS EC2, AWS S3, WandB, CUDA, OpenCL, Figma, Linux, SharePoint, Excel, PowerPoint

Relevant Experience

Data Science Intern **Costa Mesa, CA**
Neurolens June 2024 - Sept 2024

- 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&D analysis.
- 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.
- Created data visualizations utilizing Matplotlib and Seaborn to illustrate the impact of architectural updates.
- Influenced stakeholder decisions to invest in regression-based modeling for next-generation device development.

Project Manager **La Jolla, CA**
UC San Diego, CSE 110 April 2024 - June 2024

- Led a cross-functional Agile Scrum team of 8, facilitating weekly stand-ups and retrospectives that enhanced communication and reduced update turnaround times 46%, managing task progress using GitHub Projects.
- Engineered CI/CD workflows with GitHub Actions, reducing deployment errors by 24% and accelerating releases through automated JUnit unit tests and Puppeteer-based integration testing.
- Directed sprint planning and backlog refinement to synchronize front-end and back-end efforts, increasing development velocity, and improving milestone delivery rates.

Research

RedShift *LLMs, PyTorch, CUDA, HuggingFace, Prompt Engineering* January 2025 - March 2025

- Enhanced an automated red-teaming framework to evaluate large language model jailbreak vulnerabilities, increasing detection coverage across adversarial prompts and attack types.
- Built an ML evaluation pipeline where LLMs served as attackers, defenders, and judges, drawing on the "Distract LLMs for Automatic Jailbreak Attack" framework to measure jailbreak success evaluation.
- Standardized and preprocessed adversarial prompt datasets applying custom Python scripts and PyTorch data loaders, enabling consistent benchmarking of jailbreak vulnerabilities across models (ChatGPT, Vicuna, Llama, DeBERTa, DeepSeek, Grok, Gemma), with evaluation metrics monitored via WandB.

Projects

TritonTube *Go, SQLite, gRPC, etcd, AWS EC2, FFmpeg, MPEG-DASH, HTTP* May 2025 – Present

- Engineered a scalable video platform with RESTful endpoints for upload and playback through MPEG-DASH.
- Deployed metadata and content services on AWS EC2 using etcd to establish Raft consensus, expanding storage capacity, and improving concurrency through a fault-tolerant, distributed architecture.

Personal Portfolio *Next.js, Node.js, Flask, Firebase, Docker, Google Cloud, Vercel* January 2025 – Present

- Published a responsive full-stack portfolio with Next.js and Tailwind CSS, integrating a Flask and Firebase.
- Deployed on Vercel to ensure low-latency performance and showcase technical work and personal projects.

Blackjack Optimizer *Python, Pygame, NumPy, Pandas* May 2024

- Developed a RL agent for Blackjack using Q-learning and gradient descent within a Markov Decision Process.
- Improved the win rate from 23% to 45% over thousands of simulated games.
- Adding online multiplayer support with Flask and Socket.io for real-time gameplay with up to six players.

Sudoku Solver *Python, SciPy, NumPy, Pandas* April 2024

- Implemented a backtracking-based constraint solver to complete standard Sudoku puzzles in under one second.
- Optimized search efficiency with pruning techniques and currently developing a GUI-based online demo.