Nirvek Pandey

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Education

University of California San Diego	**La Jolla, CA**
Computer Science M.S.	March 2026 – June 2027
Computer Science B.S., *Regent's Scholar*	September 2022 – March 2026

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

Experience

Neurolens	**Costa Mesa, CA**
Data Science Intern	June – September 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; enabling more reliable data interpretation for optometry research.
- Data visualizations created using Matplotlib and Seaborn to illustrate the impact of data flow architectural updates.
- Influenced stakeholder decisions to invest in regression-based modeling for next-generation device development.

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

- Led a an 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.
- Designed CI/CD workflows with GitHub Actions, reducing deployment errors by 24% and accelerating releases through automated JUnit unit tests and Jest/Puppeteer-based integration testing.
- Directed sprint planning and backlog refinement to synchronize front-end and back-end efforts using GitHub projects, driving performance, and increasing milestone delivery rates from 65% to 85% in two sprints.

Projects

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

- Engineered a scalable video microservices powered platform with RESTful endpoints for upload and playback through MPEG-DASH, delivering improved video quality and reduced buffering.
- 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 – May 2025

- Transformed a basic React static site into a high-performance, interactive Next.js portfolio with optimized back end (Flask/Firebase) and Vercel deployment for rapid global load times.
- Created an card-based project layout and a streamlined, interactive "Contact Me" page to improve user experience.

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

- Enhanced an automated red-teaming framework to evaluate large language model jailbreak vulnerabilities, expanding detection efforts to 2000+ attacks across 50 adversarial prompts.
- 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/PyTorch scripts , enabling consistent benchmarking of jailbreak vulnerabilities across major models, with metrics monitored via WandB.

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.
- Iteratively grew 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.

Skills

Programming Languages: Python, Golang, Java, JavaScript/TypeScript, JSON, C++, SQL, HTML, CSS

Libraries & Frameworks: PyTorch, TensorFlow, Scikit-Learn, NumPy, Pandas, Matplotlib, Seaborn, OpenCV, TS-Fresh, React, Next.js, Express.js, Node.js, Flask, Socket.io, Tailwind CSS, JUnit, Jest, Puppeteer, FFmpeg, RESTful APIs, gRPC, protobuf

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