

Krish Patel

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EDUCATION

University of North Carolina at Chapel Hill

Dec. 2026

B.S. Computer Science, B.S. Statistics and Analytics

Current GPA: 3.89

Courses: Data Structures & Algorithms, Systems, Compilers, Distributed Systems, Computer Networks, Cryptography, Database Systems, Digital Logic, Linear Algebra, Probability & Statistics, Machine Learning, Artificial Intelligence

EXPERIENCE

UNC NLP | MURGe Lab

Aug. 2025 – Present

Machine Learning Research Assistant

Chapel Hill, NC

- Researching execution-guided reasoning methods that use neural tree search to iteratively mutate and refine model plans by integrating test feedback, symbol grounding, and ablations over mutators and ranking policies
- Evaluating iterative reasoning on long-context software engineering benchmarks to compare accuracy and efficiency tradeoffs with full-context models and quantify test-time search gains, tracking pass@k, and token budget

UNC Department of Computer Science | COMP 537, Cryptography

Aug. 2025 – Dec. 2025

Undergraduate Teaching Assistant

Chapel Hill, NC

- Creating labs on security games and reductions for PRG/PRF distinguishers, hybrid arguments, and IND-CPA

Fidelity Investments | Machine Learning Infrastructure

Jun. 2025 – Aug. 2025

Software Engineering Intern

Durham, NC

- Launched a code intelligence platform powered by GraphRAG, integrating embeddings and static analysis with multi-candidate generation and a judging pass that reduced onboarding time by ~60%
- Built AWS ETL pipelines to parse and embed ASTs, dependencies, and symbols from 120+ codebases into Neo4j knowledge graphs, tuning graph indexing for low-latency lookups that enabled p95 semantic queries in 45ms
- Developed evaluation harnesses (golden datasets, regression tests, policy, and red-team tests) that improved LLM safety, catching 25% more failures pre-release and enabling auto-gated LLM deployments with zero manual review

TECHNICAL PROJECTS

CAN-Cuda Logger | C++, CUDA, SocketCAN, LZ4

- Developed a high-speed CAN bus logger using custom CUDA kernels to batch and compress frames on NVIDIA GPUs (LZ4), sustaining 100 MB/s with zero dropped frames and reducing log size by 40%
- Overlapped PCIe transfers and kernel launches with CUDA streams to maintain over 90% GPU utilization and cap per-batch latency under 2 ms

Chrome Dino on FPGA | SystemVerilog, MIPS Assembly, Xilinx Vivado

- Designed and built a complete 32-bit MIPS computer system on a Nexys A7 FPGA, integrating custom CPU, VGA graphics, keyboard and accelerometer input, and PWM audio via memory-mapped I/O
- Wrote the full Chrome Dino game in MIPS assembly and optimized hardware logic to meet 100 MHz timing closure for stable graphics and sound

PeerBeam | Go, SvelteKit, TypeScript

- Created a cross-platform, distributed, peer-to-peer file sharing app (web UI & CLI) enabling fast, private transfers up to 90MB/s, with no relay servers required (WebRTC data channels)
- Optimized UDP over Wi-Fi using Wireshark, tuning ICE to reduce retransmissions by 20% on congested networks

STL-MLP | C++

- Built a STL-only feedforward neural network (multilayer perceptron) in C++, implementing the matrix math, forward/backward propagation, and stochastic gradient descent from scratch
- Trained and evaluated on the UCI Seeds dataset with 5-fold cross-validation and reached ~94% accuracy

SKILLS

Languages: C++, C, Python, Go, CUDA, SystemVerilog, SQL, Java

Systems & Networking: Linux, TCP/IP, Wireshark, scapy, gRPC, perf/fttrace, MPI

ML & Data: PyTorch, ONNX Runtime, TensorRT, Core ML, NumPy, Pandas

Cloud & Infra: AWS, Docker, PostgreSQL, Redis, Neo4j