Prakrut Patel

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Education

University of North Carolina at Chapel Hill Aug. 2024 – May 2026 (Expected)
M.S. Computer Science *Chapel Hill, NC*

Eckerd College Aug. 2018 – May 2022
B.S. Computer Science and Physics | ***GPA**: 3.72/4.0* *St. Petersburg, FL*

- **Honors**: Dean's List; Harry W. Ellis Award for Outstanding Achievement

Publications & Research

TalkingHeadBench: A Benchmark for Talking-Head Deepfake Detection Accepted
IEEE/CVF Winter Conference on Applications of Computer Vision (WACV 2026)

- Introduced the first manually curated, multi-modal benchmark for modern talking-head deepfakes, covering 8 state-of-the-art academic and commercial generators.
- Designed a five-stage expert-led curation pipeline filtering ∼60% of low-quality samples, resulting in 2,994 high-quality deepfake videos.
- Proposed evaluation protocols measuring detector robustness under identity and generator shifts, and conducted large-scale benchmarking and Grad-CAM analysis revealing sharp performance drops at stricter FPR thresholds (e.g., TPR@FPR=0.1%).

Prune-Then-Plan: Step-Level Calibration for Embodied QA Exploration Under Review
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2026)

- Proposed a step-level calibration framework that stabilizes VLM-guided exploration by pruning implausible frontiers before planning.
- Introduced a Holm-Bonferroni based frontier pruning rule that converts overconfident VLM predictions into conservative, interpretable actions.
- Integrated the method into the 3D-Mem EQA pipeline, achieving up to **49%** relative improvement in SPL and **33%** improvement in LLM-Match on OpenEQA and EXPRESS-Bench.

Technical Skills

Machine Learning & Vision: PyTorch, CNNs, Vision Transformers, Deepfake Detection, Object Detection, Generative Models, Benchmarking
Embodied AI & VLMs: Vision-Language Models, Embodied Question Answering, Frontier-Based Exploration
Languages: Python, C#, SQL, Bash
Systems & Tools: Docker, Linux, Git, Slurm, CUDA, Grad-CAM

Research Experience

Research Assistant Aug. 2024 – Present
UNC Department of Computer Science *Chapel Hill, NC*

- Led end-to-end development of large-scale benchmarks and evaluation protocols for deepfake detection and embodied reasoning.
- Designed dataset generation, expert curation pipelines, and train/test splits enforcing strict identity and generator separation.
- Implemented large-scale evaluation pipelines for state-of-the-art detectors and EQA agents, including metric analysis at low false-positive operating points.
- Co-developed theoretical frameworks and shared core implementation responsibilities for VLM-guided exploration and calibration.

Research Assistant May 2021 – May 2022
Eckerd College *St. Petersburg, FL*

- Trained Context R-CNN and Faster R-CNN models using the TensorFlow Object Detection API on a custom dataset.
- Performed extensive hyperparameter tuning to improve detection accuracy and reduce manual segmentation effort.

Industry Experience

Full Stack Engineer Sep. 2022 – Jul. 2024

Axiom Group *Tampa, FL*

- Rebuilt the company's core revenue-generating pipeline using C# and SSIS, increasing revenue by **50%**.
- Trained and deployed machine learning models on structured consumer data for clustering and classification.
- Developed Python and SQL-based analytics tools, improving reporting productivity by **80%**.

Leadership

Director of Tech and Coding 2021 – 2022

MakerSpace, Eckerd College *St. Petersburg, FL*

- Conducted workshops and one-on-one mentoring on 3D printing, electronics, and embedded systems.
- Guided student projects involving hardware prototyping and technical problem solving.