Saumya Chauhan

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Saumya-Chauhan-MHC

Education

California Institute of Technology *Sept 2021 – June 2025*
BS in Computer Science, Minor in Information and Data Science

- GPA: 4.1/4.0
- **Coursework:** Data Structures and Algorithms, Computer Systems, Machine Learning and Data Mining, Large Language and Vision Models, 3D Deep Learning, GPU Programming, Software Design, Microcontrollers, Networks: Structure and Economics

Experience

Undergraduate Researcher *Pasadena, CA*
Networks Lab, Caltech *April 2025 - Present*
Advisor: Prof. Adam Wierman

- Developed a multimodal Reddit-virality pipeline combining DistilBERT (misinfo titles), CLIP + Random Forest (GenAI images), and DSU clustering; uncovered multimodal amplification where mixed misinfo + GenAI cascades spread 10× deeper and persist $\sim 12\times$ longer than any prior class.
- Introduced a Virality Attention Index with a hybrid LightGBM early-warning screen that guides moderators in curbing harmful synthetic-media spread; results submitted to *MIT URTC 2025*.

Co-Founder & Technical Lead *Pasadena, CA*
EchoBlue *Jan 2025 - Present*

- Prototyped EchoBlue, an AI mobile app assistant for caregivers of children with autism that fuses pose-sequence video and IEP documents in a dual-encoder model to track milestones, detect triggers, and serve personalized strategy scripts; implemented continual-learning feedback to refine recommendations to caregivers.
- Drove market validation with 27 customer interviews across 11 stakeholder groups, built a financial model, and secured $20 K in seed funding as a finalist of the *Bill Gross Entrepreneurship Competition 2025*.

Undergraduate Researcher *Pasadena, CA*
Computer Vision Lab, Caltech *Jan 2025 - Present*
Advisor: Prof. Georgia Gkioxari

- Co-created ITTO, a point-tracking benchmark capturing extreme camera shake, non-rigid articulation, parallax, and reappearance, extending motion diversity beyond established datasets like TAP-Vid.
- Built a two-stage annotation workflow (MTurk crowd labels followed by expert frame refinement) and an object-centric query generator combining Molmo prompts with SAM2 masks to curb saliency bias under occlusions.
- Benchmarked state-of-the-art trackers, revealing steep accuracy drops in complex motion; manuscript submitted to *NeurIPS 2025*.

Undergraduate Researcher *Pasadena, CA*
Computational Cameras Lab, Caltech *Sept 2024 - Present*
Advisor: Prof. Katie Bouman

- Reconstructing dark-matter maps with a multimodal variational diffusion model: developed a conditional U-Net DDPM that jointly processes stellar-mass, lensing shear, and fast-radio-burst maps.
- Achieved high fidelity reconstructions compared to CAMELS simulations while outperforming single-modality baselines; manuscript submitted to the *2025 AI + Science Caltech–University of Chicago Conference*.

Computer Vision Research Intern *San Mateo, CA*
Computer Vision + AI Search Team, Verkada *Jan 2025 - March 2025*

Advisor: Yi Xu

- Designed and deployed a real-time threat-detection pipeline by adapting InternVideo2 Foundation Models: uniform frame sampling, optional ByteTrack + YOLOv8 person-track cropping, a distilled one-billion-parameter backbone, and a lightweight classifier head that meets on-camera latency budgets.
- Built the *Verkada-Threat-V1* corpus (approximately 20,000 clips) and a fully reproducible research suite: custom loaders, fine-tuning engine, per-class average-precision and precision–recall analysis.

Machine Learning Engineer Intern *Sunnyvale, CA*
Machine Learning Platform Team, DoorDash *June 2024 - Sept 2024*

- Created an end-to-end feature-importance workflow for LightGBM and PyTorch models that prunes low-value features in the ML Workbench's centralized store, cutting feature-store calls and costs by 5 %.

Software Development Intern *San Diego, California*
Amazon *June 2023 - Sept 2023*

- Built a Kotlin data-transformation Lambda for AWS Action Planner that eliminates Lifecycle Event Orchestrators from data transformation pipeline.

Software Engineering Intern *San Francisco, California*
Cisco AppDynamics *June 2022 - Sept 2022*

- Designed Cisco Secure Application's UI to reduce the risk of security exposure and accelerate the analysis of 1000+ software vulnerabilities.

Publications

S. Chauhan, M. Hong, M. Vazhaeparambil, *When GenAI Meets Fake News: Understanding Image Cascade Dynamics on Reddit*, submitted to *MIT URTC 2025.* May 2025

I. Demler, **S. Chauhan**, G. Gkioxari, *Is This Tracker On? A Benchmark Protocol for Dynamic Tracking* (ITTO), submitted to *NeurIPS 2025.* May 2025

S. Chauhan, A. Chandrashekar, E. Patel, M. Vazhaeparambil, *Using Multi-Modal Diffusion Models to Reconstruct Dark Matter Fields*, submitted to *AI + Science Caltech–University of Chicago Conference 2025.* Nov 2024

Presentations

Presented "When GenAI Meets Fake News: Understanding Image Cascade Dynamics on Reddit", *CMS + IST Meeting of the Minds 2025 (Caltech).* May 2025

Presented "EchoBlue: AI Assistant for Caregivers of Children with Autism", *2nd Annual Nexus Horizon Builder SoCal Showcase.* Apr 2025

Presented "EchoBlue: AI Assistant for Caregivers of Children with Autism", *Bill Gross Entrepreneurship Competition.* Apr 2025

Presented "Real-Time Threat Detection on Edge Cameras with InternVideo2 Foundation Models", *Verkada Spring 2025 Tech Fair.* Mar 2025

Awards

Bill Gross Entrepreneurship Pitch Competition — 2nd Place, 2025
Discover ServiceNow Fly-Out Program — Selected Participant, 2023
Housner Student Fund for Outstanding Undergraduate Research, 2022
Lam Research Core Values Scholarship, 2021
MLH "Hack Empowered" Best Educational App, 2022

Extracurricular & Leadership

Treasurer & Co-Founder, Caltech Entrepreneurship Club
Vice President & Co-Founder, Caltech Large Language Models Club
Captain, Caltech Women's Basketball Team
Head Health Advocate, Caltech Lloyd House
Food Representative, Caltech Lloyd House
Undergraduate Head, Caltech OASIS Indian Cultural Club