Kunjal Panchal

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Skills

Research	Memory-efficient Training and Inference, Federated Learning, LLMs at scale, On-device Inference, Quantization, Distributed ML, Optimization.
Frameworks	PyTorch, Flower (Federated Learning Framework), Torch Distributed, Hugging Face, PyTorch Mobile, ExecuTorch.

Education

University of Massachusetts Amherst *Amherst, MA*

Doctor of Philosophy in Computer Science (3.7/4.0 GPA) *Sep 2021 - Expected May 2026*

- Advisor: Dr. Hui Guan.
- Research Area: Personalization and Drift Adaptation in Federated Learning, Memory-Efficient LLM Finetuning, On-device Inference.
- James Kurose Scholar (scholarship given for systems in machine learning project, Spring 2022).
- Jumpstart Fellow (fellowship given to top 5 research proposals by new PhD students, Fall 2021).

University of Massachusetts Amherst *Amherst, MA*

Master of Science in Computer Science Research Track (3.6/4.0 GPA) *Sep 2019 - May 2021*

- Advisor: Dr. Adam O'Neill.
- Research Area: Relaxed Cryptography for Digital Signatures and Message Authentication Codes.
- **Courses:** Machine Learning, Computer Vision, Natural Language Processing, Reinforcement Learning, Robotics, Optimization in Computer Science, Advanced Algorithms, Modern Computer Architecture, Advanced Cryptography.

Work Experience

Adobe Research *San Jose, CA*

Research Scientist/Engineer Intern *May 2025 - Aug 2025*

- Built a planning algorithm for design personalization that contextually decides when to use the user's style vs. keep the original template's context, using a novel "belief-shift" scoring rule and a preference extractor to avoid overfitting.
- Designers chose our posters most often (68% Rank-1, 93% top-2) and rated them highest (4.31/5); an AI judge showed the same trend, confirming a better balance between past designs and the starter template than baselines.

Adobe Research *San Jose, CA*

Research Scientist/Engineer Intern *May 2024 - Aug 2024*

- Developed an on-device (Android, Snapdragon 765G) inference pipeline for video processing and assembly using a visual-language model. Leveraged PyTorch Quantization and PyTorch Mobile to achieve approximately 3× lower peak memory consumption.
- Refactored the visual-language model to support statically-typed forward passes and data-dependent control flows, reducing inference latency by 16.67%. Additionally optimized memory consumption through operator fusion and parameter hoisting techniques.

Research

Thinking Forward: Memory-Efficient Federated Finetuning of Language Models

Kunjal Panchal, Nisarg Parikh, Sunav Choudhary, Yuriy Brun, and Hui Guan

Published @ NeurIPS, 2024.

Flash: Concept Drift Adaptation in Federated Learning

Kunjal Panchal, Sunav Choudhary, Koyel Mukharjee, Subrata Mitra, Somdeb Sarkhel, Saayan Mitra, and Hui Guan

Published @ ICML, 2023.

Flow: Per-instance Personalized Federated Learning

Kunjal Panchal, Sunav Choudhary, Nisarg Parikh, Lijun Zhang, and Hui Guan

Published @ NeurIPS, 2023; Preliminary Presentation @ CrossFL, MLSys 2022.

CommunityBots: Creating and Evaluating A Multi-Agent Chatbot Platform for Public Input Elicitation

Zhiqiu Jiang, Mashrur Rashik, **Kunjal Panchal**, Mahmood Jasim, Ali Sarvghad, Pari Riahi, Erica DeWitt, Fey Thurber, and Narges Mahyar

Published @ ACM CSCW 2023.

Leadership / Volunteering

Oct 2025 **Workshop Organizer**, Short-Form Video Understanding @ ICCV 2025
Current **Program Committee Member / Reviewer**, NeurIPS '25/'24, ICML '25, ICLR '25, AIStats '25, AAAI '26/'25/'24, ACM MM '25, TSE '25
Oct 2024 **Poster Presenter**, UMass Amherst CS Department Undergrad Research Night
Research Mentor for Undergraduates, UMass Amherst CS department program to cultivate interest & understanding in research (Dec 2024, Jun 2024, Dec 2023, Jun 2023, Dec 2022)
Applied Deep Learning Head Mentor, Teaching applied deep learning to undergradutes at SureStart (Volunteer position) (Jun 2024, Jun 2023, Jan 2023, Jun 2022)
Nov 2023 **Panelist and Poster Presenter**, UMass Amherst CS Department Undergrad Research Night
Jan 2022 **Coding Gym Leader**, SureStart winter bootcamp to teach coding interview strategies
Oct 2021 **PhD Applicant Support Program**, Mentoring prospective PhD applicants
Mar 2021 **Machine Learning Mentor**, Virtual AI Learning Program hosted by SureStart
Aug 2020 **Emotion AI Program Mentor**, EMPath Program hosted by Affectiva
Dec 2019 **Campus Leader**, Google Developer Students Club India

Achievements

2022 **James Kurose Scholarship**, Manning College of Info and Comp Sci, UMass Amherst
2021 **CICS Jumpstart Fellowship**, College of Info and Comp Sci, UMass Amherst
2019 **Gold Medalist**, The Maharaja Sayajirao University of Baroda, B.Engg. in Computer Science
2019 **Student of the Year**, The Maharaja Sayajirao University of Baroda, B.Engg. in Computer Science
National Talent Search Examination, Top 100 in Science and Mathematics in India
All India Essay Writing Event, Honorable Mention in a state-level essay competition
Community Science Center, Winner of Conmat Cosmopolitan Tree Garden Award at state-level

Presentations

Career Pathways Seminar Speaker *Spring 2025*
- Delivered an introductory talk on privacy-preserving machine learning and on-device inference to second-year undergraduates, covering industry applications and open research challenges.

Voices of Data Science Poster Presenter *Spring 2023*
- Showcased "Flash: Concept Drift Adaptation in Federated Learning" (ICML '23) in an interdisciplinary poster session hosted across computer science, engineering and social/behavioral science departments. Winner of the poster presentation competition.

Computer Science Department Homecoming Poster Presenter *Fall 2022*
- Presented my research to the department alumni, faculty, dean, and current students, as one of the two presenters.

Computer Science Research Night Poster Presenter *Fall 2022*
- Introduced my lab and research to undergraduate and graduate students looking to understand and participate in the ongoing research works.

Cryptography Honors Seminar Speaker *Fall 2022*
- Discussed federated learning, differential privacy, applications, and why confidentiality of data is important in the world which is shifting towards data-rich artificial intelligence.

AI4ALL Summer Program Speaker *Summer 2021*
- Presented detailed pointers on how to read, understand, write research papers in AI and ML.
- Explained how to figure out unsolved yet solve-able problems, conduct research through creative solutions, evaluate results derived of the proposed approach, and discussed ethics and biases in AI.
- Encouraged 20+ undergraduate students from Boston University, Columbia University, and University of California Berkeley to pursue artificial intelligence research.