Kunjal Panchal

(413) 210 9198 | kpanchal@umass.edu | astuary.github.io/Kunjal/ | github.com/astuary | linkedin.com/in/kunjal-panchal

Skills

Programming	Python (PyTorch, Tensorflow, Tensorflow Federated, scikit-learn, Numpy, Pandas, matplotlib), Matlab, C/C++, ReactJS.
Machine Learning	Statistics, Computer Vision, Natural Language Processing, Distributed Machine Learning, Hypothesis Testing.
Miscellaneous	Linux, Shell (Bash), LaTeX, Git, Microsoft Office, Firebase.

Education

University of Massachusetts Amherst
Amherst, MA

Doctor of Philosophy in Computer Science
Sep 2021 - Expected May 2026

- Advised by Dr. Hui Guan and Dr. Adam O'Neill
- Research in Federated Learning, Personalization, Privacy-preserving Machine Learning
- Jumpstart Fellow (fellowship given to top 5 research proposals by new PhD students, Fall 2021)
- James Kurose Scholar (scholarship given for systems in machine learning project, Spring 2022)
- Adobe Fellow (fellowship given by Adobe to fund federated learning research, Fall 2022)

University of Massachusetts Amherst
Amherst, MA

Master of Science in Computer Science Research Track
Sep 2019 - May 2021

- Advised by Dr. Adam O'Neill
- Research in Relaxed Cryptography
- **Courses:** Machine Learning, Computer Vision, Natural Language Processing, Reinforcement Learning, Robotics, Optimization in Computer Science, Advanced Algorithms, Modern Computer Architecture, Advanced Cryptography

The Maharaja Sayajirao University of Baroda
Vadodara, India

Bachelor's in Engineering in Computer Science and Engineering
Aug 2015 - Apr 2019

- Gold medalist in Computer Science and Engineering (2019)
- Student of the Year (class of 2019)

Work Experience

Adobe Research
Bangalore, India

Research PhD Intern
May 2022 - Aug 2022

- Built a federated solution of personalized recommender systems for real-time learning.
- Designed a client-side optimization strategy for personalized federated learning in concept drift settings specific to a data streaming environment.
- Evaluated the proposed algorithm on benchmark computer vision and natural language processing tasks, achieving state-of-the-art personalized and generalized performance.

Manning College of Information and Computer Sciences, UMass Amherst
Amherst, MA

Research Assistant
Sep 2021 - Current

- Working on solving open issues of personalization and privacy in federated learning.
- Researching relation between individual client heterogeneity and global distribution changes.
- Formulated a per-instance and per-client personalization strategy in federated learning, increasing the personalized performance of the participating clients in the distributed training.
- Explored a more robust notion of differential privacy based on conditional statistical distance.

SureStart
New York City, NY (Remote)

AI and Machine Learning Head Mentor of MIT FutureMakers 2022
Jul 2022 - Aug 2022

- Led a 6 weeks workshop program on applied deep learning as a head mentor.
- Conducted daily sessions where I discussed the nuances of applied deep learning concepts like optimization, generative networks, algorithmic biases, regularization.
- Managed a team of 5 and guided the team to build a deep learning based capstone project addressing real-world challenges like marine pollution, automotive safety, and climate change.

College of Information and Computer Sciences, UMass Amherst
Amherst, MA

Teaching Assistant and Grader
Sep 2020 - May 2021

- Held office hours, resolved student queries, walked through homework problems for the classes CS 690C Foundations of Applied Cryptography and CS 466 Applied Cryptography.
- Graded homeworks, quizzes, assignments, exams for CS 690C, and CS 466.

Research

Flash: Federated Personalization with Drift Adaptation

Kunjal Panchal, Sunav Choudhary, Koyel Mukharjee, Subrata Mitra, and Hui Guan *Fall 2022*

To be submitted @ ICML, 2023.

Robust Indistinguishability

Monica Moniot, **Kunjal Panchal**, Amir Houmansadr, and Adam O'Neill *Fall 2022*

To be submitted @ CCC, 2023.

Flow: Fine-grained Personalized Federated Learning through Dynamic

Kunjal Panchal, Sunav Choudhary, and Hui Guan *Summer 2022*

CrossFL @ MLSys 2022

University Projects

SoundCluch - Github *Feb 2020*

- Winner of "Best use of Bose SoundTouch API" and "Best Hack for Home Accessibility sponsored by Wayfair" at Hack(h)er413 2020 at UMass Amherst.
- Enhanced Bose SoundTouch API in Python to get the motion sensor inputs within 150 cm with a Raspberry Pi, to sound off a custom audio notification through the Bose speakers.

LSTM Variants for Time-Series Data Predictions *Dec 2019*

- Utilized the human activity recognition ExtraSensory dataset, containing data from 60 individuals, for the task of probabilistic activity forecasting.
- Experimented efficacies of models like GRUs, LSTMs, CNN LSTMs, Separable CNN LSTMs.

Leadership

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

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 problems, conduct research through unique 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.