

Sanjit Dandapanthula

sanjitzdp.github.io

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EDUCATION

Carnegie Mellon University (CMU)

Ph.D. in Statistics and Machine Learning (in progress, advised by Aaditya Ramdas)

Pittsburgh, PA

Aug. 2024 –

University of California, Los Angeles (UCLA)

M.A. in Applied Mathematics (GPA: 3.92 / 4.00)

Los Angeles, CA

B.S. in Mathematics w/ honors, minor in Data Science and Engineering

Apr. 2023 – Mar. 2024

Sep. 2020 – Mar. 2023

RESEARCH INTERESTS

I am very broadly interested in mathematical statistics, with applications to modern machine learning and AI. Recently, I have been working on problems related to *deep learning theory*, *optimal transport*, *changepoint detection*, *conformal prediction*, and *multiple testing*.

EXPERIENCE

Amazon Web Services (AWS) – LogAnalytics and AI Operations

San Jose, CA

Applied Science Intern

May 2025 – August 2025

- **Representational similarity of LLMs:** Proposed a novel and theoretically principled method to compare the learned representations of LLMs for knowledge distillation tasks
- **IGW distance between Gaussians:** Proved new formulae for the inner product Gromov-Wasserstein (IGW) distance between Gaussians over infinite-dimensional spaces using optimal transport theory and convex analysis
- **Multimarginal optimal transport:** Created fast and memory-lean algorithms to solve multimarginal optimal transport problems between Gaussians using the Burer-Monteiro factorization, with provable guarantees
- **User clustering:** Applied theoretical results to cluster users using data drawn from real-world text datasets

Jet Propulsion Laboratory (JPL) at NASA

Pasadena, CA (remote)

Graduate Student Researcher (with Mikael Kuusela and Maggie Johnson)

Jan. 2025 – present

- **Remote sensing:** Built novel statistical methods to better estimate land surface temperature (LST) using remotely sensed observations from the ECOSTRESS probe, for applications in agriculture and urban planning
- **Computer vision:** Used a vision transformer (ViT) to find boundaries of agricultural fields and segment images
- **Spatiotemporal statistics:** Used parallel computing to solve Gaussian process equations involving images collected over 7 years, yielding high-resolution point estimates and uncertainty quantification of LST

Narya.ai ([The Mumble App](#) 🎧)

San Jose, CA

Lead Machine Learning Engineer

May 2024 – Aug. 2024

- **AI note-taking:** Managed entire ML pipeline for new AI note-taking app in a fast-paced startup environment
- **State-of-the-art LLMs:** Fine-tuned latest LLM models (GPT-4o, Llama 3.1 405B, Claude 3.5 Sonnet) for efficient voice-based editing, re-writing, keyword finding, and search indexing on user notes
- **Transcription:** Used Google's WebRTC-VAD model to reduce transcription hallucination during silence in audio
- **Vision RAG:** Wrote retrieval-augmented generation model to find link to original social media post or article given a user screenshot, or do other helpful contextual research using real-time information from the Internet
- **LLM privacy:** Ported many fine-tuned open-source models to Apple CoreML to use private on-device LLMs

Institute for Pure and Applied Mathematics (IPAM)

Los Angeles, CA

AI Research Intern + Project Manager

Jun. 2023 – Sep. 2023

- **Particle methods for AI:** Led a team of 4 researchers to train a network using a particle-type Monte Carlo tree search to solve the cart-pole problem in 10 seconds (roughly 30x faster than a state-of-the-art deep Q-network)
- **High-performance computing:** Wrote low-level systems code in Rust to implement multi-threading and used the CUDA platform to enable fast GPU-level concurrency

David Harold Blackwell Summer Research Institute (DHBSRI)

Berkeley, CA

ML Research Intern (with Jelani Nelson – UC Berkeley EECS)

Jun. 2022 – Sep. 2022

- **Algorithm development:** Developed new algorithms to solve the learning-augmented sorting problem in Levenshtein distance, ∞ -normed, and 2-normed metric spaces and wrote a paper proving their optimality

Polymath REU

Research Intern (with Zoran Šunić)

remote

Jun. 2021 – Sep. 2021

- **Computational graph theory:** Led a 10-person team's [programming efforts](#) to conjecture and prove recurrence relations describing the spectra of Schreier graphs of self-similar groups, which I solved explicitly

PAPERS + PREPRINTS

Gradient flow for deep equilibrium single-index models (2025)

[[arXiv](#)] [[code](#)]

Sanjit Dandapanthula and Aaditya Ramdas

submitted, JASA

Optimal transportation and alignment between Gaussian measures (2025)

Sanjit Dandapanthula, Aleksandr Podkopaev, Shiva Kasiviswanathan, Aaditya Ramdas, and Ziv Goldfeld *in progress*

Offline changepoint localization using a matrix of conformal p-values (2025)

[[arXiv](#)] [[code](#)]

Sanjit Dandapanthula and Aaditya Ramdas

submitted, TMLR

Anytime-valid FDR control with the stopped e-BH procedure (2025)

[[arXiv](#)]

Hongjian Wang, Sanjit Dandapanthula, and Aaditya Ramdas

to appear, Statistics and Probability Letters

Multiple testing in multi-stream sequential change detection (2025)

[[arXiv](#)] [[code](#)]

Sanjit Dandapanthula and Aaditya Ramdas

submitted, JASA

TALKS

Gromov-Wasserstein geometry of Gaussian measures. AWS LogAnalytics and AI Operations (2025)

Conformal changepoint localization. AWS LogAnalytics and AI Operations (2025)

Multiple testing in multi-stream change detection. 3rd Workshop on Sequential Anytime-Valid Inference (2025)

Multiple testing in multi-stream change detection. AWS LogAnalytics and AI Operations (2025)

Particle-type methods for intelligent game-playing. Joint Mathematics Meetings (2023)

Learning-augmented sorting algorithms. Simons Institute for the Theory of Computing (2022)

Schreier graphs of self-similar groups. Joint Mathematics Meetings (2021)

TEACHING

Carnegie Mellon University (CMU)

Pittsburgh, PA

TA for 36-410 (*stochastic processes and Markov chains*)

Jan. 2025 – May 2025

TA for 36-700 (*grad. probability theory and statistics*)

Aug. 2024 – Dec. 2024

Thomas M. Liggett Advanced Topics Seminar

Pittsburgh, PA

Lead instructor for semester-long graduate seminar on optimal transport (see my notes [here](#))

Jan. 2025 – May 2025

Co-organized with Kason Ancelin (Center for Machine Learning at Georgia Tech)

Olga Radko Endowed Math Circle (ORMC)

Los Angeles, CA

Lead Instructor for Advanced 1A section

Sep. 2021 – Mar. 2024

EXTRACURRICULARS + AWARDS

Extracurriculars: Crisis Text Line volunteer, Carnatic flutist, marathon runner, long-distance biker, mountaineer

Awards: UCLA Departmental Scholar (2023), Putnam Exam Top 500 Scorer (2021), National Merit Scholar (2020)

TECHNICAL SKILLS

Languages: Python, C/C++, Rust, JavaScript, Haskell, Java, MATLAB, R, SQL, Bash, LaTeX

Technologies: PyTorch, TensorFlow, Hugging Face, CUDA, Hadoop, Ray Tune, Git, numpy, sklearn, pandas