

# RUTUJA GURAV

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EDUCATION	<b>Ph. D. Computer Science</b> , University of California, Riverside USA 2019 - present <i>Research Areas: AI for Science (Gravitational-wave Astronomy, Precision Agriculture, Multi-modal Geospatial Analysis), Foundation Models, Data Mining, Machine Learning, Deep Learning</i>
	<b>M.S. Computer Science</b> , University of California, Riverside USA 2017 - 2019
	<b>B.E. Computer Engineering</b> , University of Mumbai, India 2013 - 2017
RESEARCH EXPERIENCE	<b>University of California, Riverside</b> <i>Graduate Student Researcher, M.S. &amp; Ph.D.</i>
	<b>LIGO Scientific Collaboration, Caltech</b> <i>Visiting Student Researcher</i> Focus: Machine Learning for noise hunting in Advanced LIGO detectors.
WORK EXPERIENCE	<b>Frontier Development Lab (FDL)</b> , a public-private partnership with <b>NASA, Google</b> and <b>NVIDIA</b> <i>Researcher</i> June – August 2024 Project: Forecasting radiation exposure for human spaceflight with multi-modal deep learning
	<b>Lawrence Livermore National Lab (LLNL)</b> <i>Graduate Summer Research Intern (Team: Data Science &amp; Analytics Group)</i> June - September 2022 Project: Failure analysis for multi-scale, multi-physics simulations using Graph Neural Networks (GNNs).
	<b>Lawrence Livermore National Lab (LLNL)</b> <i>Team Lead: Data Science Challenge</i> September 2021 Task: Led a group of undergraduate students to build machine learning models for - 1. classifying stars and galaxies using HSC images from the Subaru Telescope in Hawaii, 2. detecting asteroids in images from ZTF astronomical survey.
	<b>Oak Ridge National Lab (ORNL)</b> <i>Graduate Summer Research Intern (Team: Geoinformatics Engineering)</i> June - August 2021 Project: Conflation of Geospatial POI Data and Ground-level Imagery via Link Prediction on Joint Semantic Graphs.
	<b>Esri Inc.</b> <i>Data Science Intern (Team: GeoAI)</i> June - August 2018 Project: Water mains breaks prediction using historic pipe records to forecast future breaks in water supply pipelines to aid risk assessment and maintenance.
	<b>UC Riverside</b> <i>Teaching Assistant</i> Courses: CS108/212 Data Ethics (Winter 2025) CS235 Data Mining Techniques (Fall 2021, Fall 2024) CS170 Introduction to Artificial Intelligence (Winter 2020, Summer 2020, Spring 2021) CS010 Introduction to Computer Science (Spring 2020, Fall 2020)
TECHNICAL SKILLS	Programming Languages & Software - Python (proficient); C/C++, Java, MATLAB (intermediate) Machine Learning - Numpy, Scipy, Pandas, Scikit-learn, Scikit-optimize Deep Learning - PyTorch / Lightning, Tensorflow / Keras Tensor Analysis - Tensorly (Python); Tensor Toolbox toolbox (MATLAB) Collaboration & Experiments Tracking - Git / Google Colab, Weight & Biases / Tensorboard
PUBLICATIONS	<i>AI for Gravitational-wave Astronomy</i>

Barish, B. C., Richardson, J., Papalexakis, E. E., & Gurav, R. (2023). Machine Learning for Complex Instrument Design and Optimization. In Artificial Intelligence for Science: A Deep Learning Revolution (pp. 95-116).

Gurav, R., Papalexakis, E. E., Vajente, G., Richardson, J., & Barish, B. (2022, October). Identifying Witnesses to Noise Transients in Ground-based Gravitational-wave Observations using Auxiliary Channels with Matrix and Tensor Factorization Techniques. In NeurIPS 2022 AI for Science: Progress and Promises.

Gurav, R., Barish, B., Vajente, G., & Papalexakis, E. E. (2020, October). Unsupervised matrix and tensor factorization for LIGO glitch identification using auxiliary channels. In AAAI 2020 Fall Symposium on Physics-Guided AI to Accelerate Scientific Discovery.

Gurav, R., Barish, B., & Papalexakis, E. E. (2019, July). Multilinear Factorized Representations for LIGO Glitches in Label- scarce Settings. In ACM SIGKDD Conference on Knowledge Discovery and Data Mining 2019 Workshop: Fragile Earth: Theory Guided Data Science to Enhance Scientific Discovery.

### ***AI for Precision Agriculture***

Gurav, R., Patel, H., Shang, Z., Eldawy, A., Chen, J., Scudiero, E., & Papalexakis, E. (2023). Can SAM recognize crops? Quantifying the zero-shot performance of a semantic segmentation foundation model on generating crop-type maps using satellite imagery for precision agriculture. In NeurIPS 2023 AI for Scientific Discovery: From Theory to Practice.

### ***AI for Geospatial Science***

Gurav, R., De, D., Thakur, G., & Fan, J. (2021, November). Conflation of geospatial POI data and ground-level imagery via link prediction on joint semantic graph. In Proceedings of the 4th ACM SIGSPATIAL International Workshop on AI for Geographic Knowledge Discovery (pp. 5-8).

**PATENT** Conflation of geospatial points of interest and ground-level imagery, US12008800, 2024/6/11

<b>CERTIFICATES</b>	Generative AI with Large Language Models, DeepLearning.AI	May 16, 2024
	How do Diffusion Models Work, DeepLearning.AI	November 26, 2024
	Machine Learning, Stanford University	August 11, 2016
	AWS S3 Basics, Coursera Project Network	May 24, 2024

**VOLUNTEER SERVICES** **Research Mentor** June - August 2022  
*Affiliation: LIGO Scientific Collaboration*  
Project: Mentored a visiting student on the Summer Undergraduate Research Fellowship (SURF) working on transient noise source identification.

**Research Mentor** June - August 2023  
*Affiliation: LIGO Scientific Collaboration*  
Project: Mentored a visiting student on the Summer Undergraduate Research Fellowship (SURF) working on seismic state characterization.

**Research Mentor** September 2022 - August 2023  
Digital Agriculture Fellowship, Research in Science and Engineering (RISE)  
*Affiliation: Digital Agriculture Group @ UCR*

**Conference Reviewer:** WSDM 2020, CIKM 2021, AAAI 2023, NeurIPS AI for Physical Science 2024

**Program Chair Member:** FSS 2021, SMC 2021