# RUTUJA GURAV

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**EDUCATION**

**Ph. D. Computer Science**, University of California, Riverside USA — June 2019 - present
*Research Areas: AI for Science (Gravitational-wave Astronomy, Precision Agriculture, Multi-modal Geospatial Analysis), Foundation Models, Data Mining, Machine Learning, Deep Learning*

**M.S. Computer Science,** University of California, Riverside USA — September 2017 - June 2019

**B.E. Computer Engineering,** University of Mumbai, India — June 2013 - June 2017

**RESEARCH EXPERIENCE**

**University of California, Riverside**
*Graduate Student Researcher, M.S. & Ph.D.*

**LIGO Scientific Collaboration, Caltech**
*Visiting Student Researcher*
Focus: Machine Learning for Advanced LIGO

- Exploring data mining and machine learning solutions for noise hunting in Advanced LIGO detectors.
- Tackling transient noise characterization to understand their origins and correlating transient noise artifacts to non-astrophysical instrumental or environmental sources.

**WORK EXPERIENCE**

**Lawrence Livermore National Lab (LLNL)**
*Graduate Summer Research Intern (Team: Data Science & Analytics Group)* — June - September 2022
Project: Modeled multi-scale, multi-physics simulations using Graph Neural Networks (GNNs).
*Team Lead: Data Science Challenge* — 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.

**Oak Ridge National Lab (ORNL)**
*Graduate Summer Research Intern (Team: Geoinformatics Engineering)* — June - August 2021
Project: Conflation of Geospatial POI Data and Ground-level Imagery via Link Prediction on Joint Semantic Graphs.

**Esri Inc.**
*Data Science Intern (Team: GeoAI)* — 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.

**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

**SELECTED PUBLICATIONS**

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. ***(AI for Gravitational-wave Astronomy)***

Gurav, R., et al. (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 Precision Agriculture)***

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). ***(AI for Geospatial Analysis)***

**VOLUNTEER SERVICES**

**Research Mentor**
Summer Undergraduate Research Fellowship (SURF) — June - August 2022 & 2023
*Affiliation: LIGO Scientific Collaboration*
Digital Agriculture Fellowship, Research in Science and Engineering (RISE) — September 2022 - August 2023
*Affiliation: Digital Agriculture Group @ UCR*

**Conference Reviewer:** WSDM 2020, CIKM 2021, AAAI 2023
**Program Chair Member:** FSS 2021, SMC 2021