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, Artificial Intelligence

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, N-way toolbox (MATLAB)
Collaboration and 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