

DR. SRASHTI GOYAL

Astro-physicist with 5+ YoE in Data Science & Mathematical Modeling

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EXPERIENCES

Research Scientist

Max Planck Institute for Gravitational Physics

October 2023 – Ongoing Potsdam, Germany

- Develop numerical tools to model the astrophysical diffraction (like X-ray) effects in the lensing of gravitational waves to probe the universe's matter distribution, contributing to the package GLOW.
- Forecast detection prospects for future experiments using distributed computing for many sources. 2+ papers published.

Data Analyst Volunteer

TANIT New Earth Solutions

June 2024 - ongoing Berlin, Germany

- Data gathering, literature review and scientific advice for carbon farming solutions.

Gravitational Waves Data Scientist,

LIGO Scientific Collaboration (LSC) of 1000+ Scientists worldwide

October 2020 – Ongoing Remote

& Senior Research Fellow (PhD program)

International Center for Theoretical Sciences, Tata Institute of Fundamental Research (ICTS-TIFR)

August 2019 - September 2023 Bengaluru, India

- Bayesian analysis to test gravity theories against time series data. 3+ papers published.
- Pioneered a machine learning algorithm for strong lensing identification (LensID) using CNNs, feature engineering, transfer learning and XGBoost classification algorithm. Performed similar to Bayesian method but 1000x faster. End-to-end deployment for LIGO's real data analysis. 3+ papers published.
- Found 'the most promising' lensing candidate out of 5000 event-pairs observed by LIGO during 2019-2020.
- Voluntary research on COVID-19 data: Statistical analysis and data-driven modelling of disease and various intervention strategies for different countries. Resulted in a paper that was highly appreciated by software industry experts.

BS & MS Dual Degree Program

Indian Institute of Science Education & Research, Kolkata (IISER-K)

August 2013 – June 2018 Kolkata, India

- Master's Thesis: Nonlinear dynamical analysis and mathematical modelling of wave-like patterns from a biological experiment using non-linear partial differential equations in C with OPENMP.

SKILLS

Programming: Python, C, MATLAB, NetLogo, Mathematica, LATEX.

Software/Packages: Pandas, Scipy, Scikit-learn, TensorFlow, Keras, OpenMP, Condor, Configparser, Jupyter, Github.

Languages: English (C2), German (A1)

Problem Solving & Critical Thinking

Inter-disciplinary Research

Mentoring

Project Management

Literature Review

Presenting and Collaborating

Science Outreach

(Deep) Machine Learning

Big Data Analysis

Building Python Packages

Technical Writing

Simulation & Modeling

Bayesian Inference

Statistics & Mathematics

ACHIEVEMENTS

- 12+ Publications, 15+ International Conferences & Workshops, 6+ Invited talks, 4+ Poster presentations, 5+ Mentees, 4+ Outreach events, and 3+ Courses tutored.
- 99.5 percentile score in IIT-JEE 2013 and JEST 2018 competitive exams.
- DST-Inspire Fellowship Recipient 2013-2018.

PERSONAL INTERESTS

Hobbies: Yoga, Dancing, Swimming, Trekking, Playing instruments, Learning new things and Travelling.

Philosophy: I am enthusiastic about new challenges in life and curious about various things like sustainability, climate change, the economy, forests, human behaviour and physics. I aim to work towards a positive (and possibly high) impact on society and the natural environment.

REFEREES

Dr. Parameswaran Ajith: ajith@icts.res.in
Jerome Goerke: jerome.goerke@greentech.training