DR. SRASHTI GOYAL

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srashtig srashti.goyal/projects srashtig.github.io/personal

Physics PhD with **7+ years of experience** in machine learning, Bayesian statistics, computational modelling, scalable data pipelines and interdisciplinary research. Proven record of delivering production-ready ML tools and impactful scientific contributions. Passionate about solving challenging real-world problems.

EDUCATION

BS-MS Dual Degree in Physics at IISER-K

Indian Institute of Science Education & Research, Kolkata

Aug 2013 – June 2018 Kolkata, India

- Master's Thesis: Numerical modeling wave-like patterns from a biological experiment encapsulating a complex network of reaction diffusion systems as non-linear PDEs.

PROFESSIONAL EXPERIENCE

Research Scientist in Astrophysics

Max Planck Institute for Gravitational Physics

Oct 2023 – Ongoing Potsdam, Germany

- Contributed to GLoW, advanced numerical algorithms of diffraction lensing. Code, Publication
- **Forecast detection probabilities of diffraction effects** for the upcoming space-based gravitational wave detector, called LISA, using **distributed computing**.
- Improved the accuracy of an existing Bayesian method to identify strongly lensed signals by 80%. Publication

PhD in Physics on Gravitational-wave Astronomy

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

Aug 2018 - Sep 2023 Bengaluru, India

LIGO Scientific Collaboration (LSC)

Oct 2020 – Ongoing Remote - worldwide

- Pioneered a **ML algorithm using CNNs**, achieving 1000x faster compared to Bayesian methods for identification of rare repeated signals, due to gravitational lensing, from merging black-holes. Deployed it for real-time analysis, found the most significant candidate out of 5K+ events.Code, Publication
- Developed **Bayesian hypothesis testing** to rule out alternative gravity theories against Einstein's theory of relativity using the observed time series data in gravitational-wave detectors. Code, Publication
- **Proposed a mathematical model of COVID-19** disease spread and various intervention strategies for different countries with **time-series data analysis**, voluntarily. Code, Publication

SKILLS

Technical Stack

Python | C | MATLAB | SQL | TensorFlow | Scikit-learn | OpenMP | GPU | LaTeX | Scipy | Pandas

Data Science Expertise

Bayesian Inference | Deep Learning | Computer Vision | Statistical Modeling | Distributed Computing

Tools

Gitlab CI/CD | Slurm | Condor | Docker | Jupyter

ACHIEVEMENTS

12+ Journal Articles
0000-0002-4225-010X

2+ Open-source codes in LIGO GitLab
srashti.goyal/projects

15+ Conferences, 6+ Talks, 4+ Mentees
across Australia, UK, EU, India.

Max Planck Fellow
for post-doctoral research in Germany.

99.5 percentile in JEE 2013 and JEST 2018
Top ranker in competitive entrance exams.

DST-Inspire Fellow
for Undergraduate Science Research by Govt. of India.