Liting Xiao

Resume

Contact

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Education

California Institute of Technology (Caltech), Pasadena, CA *2016 – 2023*

Ph.D., Physics, 2023; M.S., Physics, 2020 **(GPA: 4.1/4.0)**

- Graduate research assistant at the Laser Interferometer Gravitational-Wave Observatory (LIGO) at Caltech (**The Nobel Prize in Physics in 2017**)
- Dissertation: Searching for Gravitational Waves from Compact Binary Coalescences and Stochastic Backgrounds in the LIGO–Virgo Detector Network (Advisor: Prof. Alan J. Weinstein)
- Relevant coursework: Introduction to Probability Models; Statistical Inference; Bayesian Statistics and Data Analysis; Learning Systems; Machine Learning & Data Mining

University of Virginia (UVA), Charlottesville, VA *2011 – 2015*

B.A., High Distinction, Astronomy-Physics; B.A., Mathematics **(GPA: 3.8/4.0)**

- Senior Theses: (1) Probing the Orbital Lifetime and Stability in Kepler Multi-planet Extrasolar Systems; (2) The Occurrence of Compact Groups of Galaxies Through Cosmic Time
- Honors: **Echols Scholar**; Member of National Physics Honor Society – **Sigma Pi Sigma**; 2015 UVA International Studies Office Award for Academic Excellence; 2014 UVA Outstanding Undergraduate Physics Research Award; 2014 – 2015 and 2013 – 2014 UVA Physics Department Mitchell Scholarship

Joseph Fourier University, Grenoble, France *Jun – Jul 2012*

Summer, Overseas Summer Program – Physics Large Scale Facilities

Work Experience

Graham Capital Management, L.P. (GCM), Rowayton, CT *2022 – Present*

Quantitative Research Analyst, Quantitative Strategies

- Researching methods to make GCM's current trading systems more efficient, profitable and robust
- Developing innovative systematic trading signals to complement and diversify the GCM's production strategies in terms of style, source of alpha and markets traded
- Expanding the capability of portfolio construction and optimization to maximize performance while controlling risk, drawdowns and trading cost

PhD Research Highlights

An Unmodeled Search for Anisotropic Stochastic Gravitational-wave Backgrounds (SGWBs)

- Led the development of a Python-based, end-to-end data pipeline to map the intensity of the SGWB signal on the sky in the pixel domain model-independently via maximum likelihood solutions
- Cast time-segment radiometer analysis to a matrix multiplication problem using folded data and employing efficient parallel processing of data for a speedup of 1000-fold
- Identified spectral leakage to neighboring pixels of well-localized simulated sources due to the detector response function through Monte Carlo sampling
- Investigated better regularization techniques of inverting the full pixel-pixel Fisher information matrix through adaptive frequency banding and adaptive pixelization in distinct frequency bands

Improving the Streamline Gravitational-wave (GW) Detection Pipeline – PyCBC

- Collaborated in expanding the search ability of the PyCBC GW detection pipeline by 10%, windowing out a small stretch of data centered on loud instrumental transients
- Operated PyCBC to analyze months of time-series data and personally identified 2 GW events during LIGO–Virgo Observing Run 3
- Characterized confident detections and potential triggers, integrated into an extended catalog of GW transients, and prepared open data release for the astronomy community
- Exploited signal coherence and noise incoherence in different detectors to improve detection statistic

Skills

- Computing: **Python** (NumPy, SciPy, pandas, scikit-learn, TensorFlow, PyTorch), **Matlab**, Git, SVN, Shell, Condor, LaTeX, SQL, C, Java, JavaScipt
- Languages: English (*full professional*), Mandarin Chinese (*native*)

Independent Projects

- High Frequency Price Prediction of Index Futures: Built a machine learning pipeline (data processing and manipulation, model building and training, model selection) using high frequency market order book data of a futures contract to predict the probabilities of future 1-second price movements
- MovieLens Dataset Matrix Factorization and Visualization: Explored and cleaned the MovieLens data, implemented different singular value decomposition methods to visualize and interpret the movies
- Shakespearean Sonnet Generator: Built and trained Recurrent Neural Networks (RNNs) and Hidden Markov Models (HMMs) to generate sonnets of Shakespeare's writing style

Publications

- **10** short-author list publications in physics and astronomy
- **80**+ full-author list publications in physics and astronomy