Beichen Xu

Curriculum Vitae

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Education

2023-2024 **MRes Machine Learning and Big Data in the Physical Sciences**, *Imperial College London*, Department of Physics

2020–2023 **B.Sc. Physics**, *University of Birmingham*, School of Physics and Astronomy

Work Experience

Internships

2022 **Summer Intern**, Kavli Institute of Cosmology Cambridge, Cambridge

- Investigated machine learning-enhanced Bayesian inference.
- Used nested sampling to train cosmology data and masked aggressive flow to generate the posterior of different parameters.
- Developed and trained machine learning models to enhance data analysis accuracy.
- Created visualizations, including 2D plots and GIFs, to illustrate AI training processes.
- Contributed to the "margarine" Python package on GitHub by adding a new objective function.
- Gained proficiency in computing tools such as Linux, vim, vimteractive, ssh, tmux, tqdm, and TensorFlow, and studied Python packages like margarine and anesthetic.

2021 **Summer Intern**, Purple Mountain Observatory, Nanjing

- Analyzed Gamma Ray Burst (GRB) data to investigate their causes and mechanisms.
- Utilized Python for data fitting and analysis, focusing on Swift GRB data.
- Enhanced programming skills in Python and the iminuit library.

Project Experience

Academic

2024 **MRes Project**, Imperial College London, London

- Created simulated multi-source gravitational wave time-series data.
- Developed and trained WGAN models to analyze gravitational wave signals.
- Utilized Imperial College London's HPC for training and performed data visualization.
- Debugged neural networks to improve performance and accuracy.
- Employed PyTorch, PyTorch Lightning, and GetDist for model development, training and analysis.

Awards

2018 18th Award Program for Future Scientists – Second Prize

2019 Physics Olympiad in Jiangsu Province, China – First prize

Computer Skills

Programming Python, C++, Mathematica, PyTorch, TensorFlow, SQL, Lightning

Computing Unix, Bash, vim, git, LaTeX, FPGA (VHDL/Verilog)

OS Linux, Windows

Languages

Chinese Native

English Intermediate *Conversational fluency*

Publications

1 Xu, Beichen, Jun Su, and Weiguo Wang. "An expanding balloon: a small universe." *Physics Education* 53.6 (2018): 065005.