Sage Li

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Education

Georgia Institute of Technology — Atlanta, GA
Master of Science in Computational Data Analytics — *Aug. 2024 – Current*

Georgia Institute of Technology — Atlanta, GA
Bachelor of Science in Physics — *Aug. 2020 – May 2024*

Experience

Research Intern — May 2022 – May 2023
NASA Ames Research Center — *Mountain View, CA*

- Managed high performance computing (HPC) resources to simulate stellar fluid dynamics.
- Architected simulation setup pipelines in Python, reducing runtime over older versions by over 70%.
- Introduced new functionality to fluid simulations, allowing consideration of magnetic field effects.
- Utilized Numpy, Pandas, and SciPy to conduct and automate time-series analysis on 100+ TB of data.
- Experimented with PyTorch classification models to reduce stellar observation noise.

Undergraduate Researcher — January 2022 – May 2022
Compuataional Combustion Laboratory — *Atlanta, GA*

- Leveraged high-performance computing to simulate ramjet combustion dynamics.
- Automated time-series analysis of 100+ GB of raw data using Python and MATLAB.
- Developed a mathematical model to identify critical parameters influencing jet stability.

Projects

General Relativistic Ray Tracer | *Python, NumPy, Numba (CUDA), Matplotlib, Numerical Methods*

- Developed a simulation engine in python (numba) that traces photon trajectories in Schwarzschild spacetime by numerically solving null geodesic equations with a Runge–Kutta integrator.
- Accelerated computations using Python, NumPy, and Numba CUDA for massive parallelism.
- Optimized GPU grid/block configurations to achieve a 300+ times speedup over CPU-based methods.

Hit Error Analysis | *Python, Pandas, Numpy, pymc (MCMC), tkinter*

- Conducted a bayesian analysis on user hit error in popular online rhythm game "osu!".
- Developed novel algorithms for object detection, improving runtime over similar programs by over 80%.
- Created a GUI-based dashboard application for seamless integration of visualization and data collection.
- Constructed a hierarchical Bayesian model in pymc, identifying high-impact parameters on game performance.

Algorithmic Stock Trading | *Python, Numpy, Pandas, SciPy, PyTorch, Scikit-learn*

- Developed a Python-based strategy backtesting and automated trade submission framework.
- Derived novel indicators for use in technical analysis and trading algorithms.
- Implemented a machine learning based market neutral pair trading strategy utilizing clustering.
- Developed a recurrent neural network (RNN) to predict market regimes and their ideal trading strategies.

Conferences/ Abstracts

Kitiashvili, I., Wray, A., Li, S., Granovsky, S., & Mullaney, K. (2023). Advances in 3D realistic modeling of solar-type stars to study stellar jitter and photospheric and subsurface dynamics [Abstract]. *American Astronomical Society Meeting Abstracts*, 55(2), 316.01.

Granovsky, S., Kitiashvili, I., Wray, A., & Li, S. (2023). Modeling the stellar jitter for the reduction of stellar radial velocity noise for star HD121504 [Abstract]. *American Astronomical Society Meeting Abstracts*, 55(2), 316.02.

Technical Skills

Programming: Python, R, SQL, Java, JavaScript, MATLAB
Frameworks & Libraries: NumPy, Pandas, Scipy, Matplotlib, scikit-learn, PyTorch, Numba, OpenCV
Tools & Platforms: Linux, Bash, regex, Git/GitHub, Jupyter Notebook, Google Firebase, Docker, Kubernetes
Languages: English, Chinese (Mandarin), Japanese