Lijie Ding

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Experience

Oak Ridge National Laboratory (ORNL) Oak Ridge, TN
Postdoctoral Research Associate (Neutron Scattering Division) May 2024 – Present

- **Multi-Agent Systems:** Developed "SasAgent," a multi-agent AI system used to automate complex small-angle scattering data analysis, integrating domain-specific tools with LLM orchestration.
- **LLM Application Development:** Engineered "ToPolyAgent" and protocol routing frameworks to assist with coarse-grained topological simulations and user facility proposal selection.
- **Deep Learning for Inverse Problems:** Designed and trained deep learning models to decipher structural properties of polymers and colloids from scattering data, significantly accelerating analysis speed compared to traditional fitting.
- **Scientific Machine Learning:** Collaborated on Bayesian inference and Gaussian Process Regression (GPR) models to unlock hidden information in sparse measurement data.

Goldman Sachs New York, NY
Vice President, Quantitative Strategist Jan 2024 – May 2024
Associate, Quantitative Strategist Jun 2022 – Dec 2023

- **Financial Modeling:** Developed and calibrated valuation models for exotic derivatives (Bermudan Swaptions, CMS Binary) and inventory securities.
- **Data Analysis Pipeline:** Built large-scale attribution analysis tools to track price variance against market consensus and risk factors (IR Basis/Xccy, FX spot).
- **ML Research:** Conducted research on applying Deep Learning and Machine Learning to option pricing and volatility surfaces, bridging traditional quantitative finance with modern AI techniques.
- **Statistical Analysis:** Expanded data scope and performed rigorous statistical testing for SOFR-based pricing models.

Brown University Providence, RI
Ph.D. Researcher (Computational Physics) Sep 2017 – Jun 2022

- Developed high-performance C++ simulation frameworks for Monte Carlo studies of soft matter systems.
- Implemented parallel algorithms on HPC clusters (Slurm) and developed Python pipelines for statistical data analysis and visualization.

Technical Skills

- **Machine Learning & AI:** Large Language Models (LLMs), Multi-Agent Systems, Deep Learning (CNNs, MLPs), Gaussian Processes, Bayesian Inference, Generative AI.
- **Programming & Data:** Python (PyTorch, NumPy, SciPy, Pandas, Scikit-learn), C++, SQL, Bash.
- **Tools & Platforms:** Git, Linux, High-Performance Computing (Slurm), LaTeX.
- **Domain Knowledge:** Quantitative Finance (Derivatives Pricing), Computational Physics (Monte Carlo), Time Series Analysis.

Education

Brown University Providence, RI
Ph.D. in Physics (Dissertation: Chiral Liquid Crystals on Deformable Surfaces) 2022
University of Science and Technology of China (USTC) Hefei, China
B.Sc. in Applied Physics 2017