Xiaoyu Fan

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Summary

Research Computing Specialist at Brown University's Office of Information Technology with hands-on experience supporting large-scale scientific workloads on Linux-based HPC clusters. Provide daily technical support to faculty, researchers, and students, resolving issues in Slurm scheduling, software environments, and cluster performance. Skilled in software installation, system maintenance, and user training for Python, R, MATLAB, VSCode, and JupyterLab. Experienced in managing Stronghold secure data platforms and delivering workshops to improve research computing efficiency and compliance.

Technical Skills

Programming & Tools: Python, Bash, R, MATLAB, Git, VSCode, JupyterLab, VNC/Remote Visualization

HPC & Systems: Linux (CentOS, Ubuntu), Slurm, Module System, Cluster Administration

User Support & Training: Scientific software installation, performance troubleshooting, workshop delivery

Security & Compliance: Stronghold secure data platform, Windows/Linux environment management, data access control

Professional Experiences

Brown University - Office of Information Technology | Research Computing Consultant 09/2022 – present

- Provide daily research computing support to 5,000+ users and 1,000+ research groups on the university Linux HPC cluster.
- Install, maintain, and document HPC software modules; assist researchers with Python, R, MATLAB, and Bash scripting.
- Manage and monitor 100+ secure data workstations within the Stronghold environment (Windows & Linux).
- Deliver user training and technical workshops on HPC usage, Slurm job scheduling, and JupyterLab/VSCode integration.
- Coordinate workstation validation, user group permissions, and compliance measures for sensitive research data handling.
- Collaborate with IT and research teams to troubleshoot computational performance and improve cluster usability.

Brown University - Department of Earth Sciences | Research Associate (Project Leader) 09/2019 – 08/2022

- Conducted large-scale numerical simulations on HPC systems to evaluate model performance and computational scalability.
- Guided graduate researchers in optimizing workflows and using HPC tools for efficient scientific computing.

Meteorological Observatory of Zhejiang Province, China | Intern 07/2016 – 08/2016

- Operated numerical weather prediction models and analyzed outputs for daily forecasts and typhoon tracking.
- Supported data-driven disaster preparedness by processing regional model simulations for flood and storm prediction.

Education

Brown University | Providence, RI, US 09/2019 – 08/2022

MSc. in Earth, Environmental, and Planetary Sciences (Computational Ocean Modeling)

Focus on numerical simulation, parallel computation, and performance benchmarking of large-scale geophysical models.

Hong Kong University of Science and Technology | Hong Kong, China 09/2017 – 06/2018

MSc. in Environmental Science and Management (Numerical Weather Modeling)

Zhejiang University | Hangzhou, China 09/2013 – 06/2017

BSc. in Atmospheric Science (Satellite Data Analysis). GPA Top 15%, Outstanding Graduates Award

Projects

High-Performance Simulation Benchmarking for Ocean Models

Published in Geoscientific Model Development, Vol. 17, pp. 4095–4113, May 2024 09/2019 – 08/2022

- Conducted large-scale ocean simulations on multi-node HPC systems to advance coastal turbulence modeling.
- Benchmarked strong/weak scaling and domain decomposition, improving computational efficiency and scalability.
- Automated data processing and performance diagnostics, enhancing workflow reproducibility and research throughput.

Performance Evaluation of WRF Cumulus Schemes in Typhoon Prediction 09/2017 – 06/2018

- Executed Weather Research and Forecasting (WRF) simulations with multiple schemes to assess hurricane forecasts.
- Compared model outputs with observed datasets to quantify performance differences across parameterization schemes.

Mesoscale Analysis of Satellite Precipitation Data in Typhoon Events 10/2016 – 06/2017

- Analyzed satellite weather data for hurricanes, identifying NASA's TRMM dataset as more accurate in heavy rainfall conditions.