Jinyang Li

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AREAS OF RESEARCH

- Large-scale Rainfall-runoff/Flooding Modeling (Extreme Events Prediction)
- Reservoir Inflow Simulation & Operation Optimization (Control and Reinforcement learning)
- Machine Learning Applications in Hydrology (Transformer, Generative AI, RL)
- Remote Sensing for Environmental & Public Health Applications (Malaria risk mapping)

EDUCATION

2021-present **Ph.D. Candidate** – Computational Hydrology. University of California, Irvine, CA.
Advisor: Prof. Soroosh Sorooshian, Prof. Kuo-lin Hsu

2019-2021 **M.S.** – Civil and Environmental Engineering, University of California, Irvine, CA
Thesis: Exploration of Deep Learning Models on Streamflow Simulations
Advisor: Prof. Kuo-lin Hsu

2015-2019 **B.S.** – Environmental Science. Sichuan University, Chengdu, China
Thesis: Estimation of PM_{10} in China using Random Forest Model in 2013 – 2016
Advisor: Prof. Yu Zhan

WORKING EXPERIENCE

2025/06-2025/11 **Research Intern, Oak Ridge National Laboratory, Oak Ridge, TN**

- Developed a spatially distributed, data-driven hydrologic modeling framework across 921 North American catchments.
- Achieved improved streamflow predictions compared to lumped models, with NSE and KGE increased in 75.4% and 72.9% of catchments, respectively. (Manuscript under review at *Water Resources Research*)

2024/10-2025/06 **AI Research Intern, Fujitsu Research of America, Inc., Santa Clara, CA**

- Developed an AI-foundation model for global flooding prediction, benchmarked against Google's LSTM model across over 6,000 catchments while reducing 87% computing length. (Led development of StreamFormer, an efficient Transformer-based global streamflow model now under review at *AAAI*)
- Tackled landslide data scarcity by leveraging a multi-task learning framework jointly trained with streamflow signals, achieving a 12% performance improvement compared to NASA's operational xgboost model (Another paper under preparation).

2021/09-now **Graduate Research Assistant, Center for Hydrometeorology and Remote Sensing,** Department of Civil and Environmental Engineering, University of California, Irvine, CA

- Develop advanced Deep learning model to improve hydrologic predictions
- Support NSF/NIH grant and proposal writings

HONORS & AWARDS

2025 Graduate Scholar Success Fund Fellowship, UCI
2024 Outstanding Student Presentation Award (OSPA), American Geophysical Union (AGU)
2022 UCI Associated Graduate Students (AGS) Travel Grant, UCI
2022 HydroML Symposium Travel Grant, Penn. State University
2020 Excellence in Engineering Communication, UCI

PUBLICATIONS

In review

2025 **Li, J.**, Hsu, K. L., Sorooshian, S., & Lu, D (in review). From Lumped to Spatially Distributed Hydrologic Models: A Generalizable Data-Driven Framework Across North America. ***Water Resources Research***.

2025 **Li, J**., Ushijima, H., Hsu, K. L. (in review) StreamFormer: Scalable and Accurate Global River Streamflow Forecasting with Transformers. ***Proceedings of the AAAI Conference on Artificial Intelligence (Top AI conference).***

2025 **Li, J.**, Hsu, K. L., Jiang, A. L., & Sorooshian S. (in review). Improving Regional Rainfall-runoff Modeling Using Attention-based Model. ***Journal of Hydrology***. [DOI: 10.22541/essoar.174690684.43716119/v1]

Published

2024 **Li, J.**, Dao, V., Hsu, K., Analui, B., Knofczynski, J. D., & Sorooshian, S. (2024). Improving Cascade Reservoir Inflow Forecasting and Extracting Insights by Decomposing the Physical Process Using a Hybrid Model. ***Journal of Hydrology***, 630, 130623. [DOI: 10.1016/j.jhydrol.2024.130623]

2025 **Li, J**., Hsu, K. L., Jiang, A. L., & Yan G. (Accepted). Predicting *An. stephensi* Environmental Suitability in the Greater Horn of Africa using Remote Sensing and Ensemble modeling. ***International Journal of Applied Earth Observation and Geoinformation***. [DOI: 10.2139/ssrn.5218877]

2025 Zhang, Y., Ye, A., **Li, J.**, Analui, B., Nguyen, P., Hsu, K., & Sorooshian, S. (2025). Improve streamflow simulations by combining machine learning pre-processing and post-processing. ***Journal of Hydrology***, *655,132904***.** [DOI: 10.1016/j.jhydrol.2025.132904]

2025 Chen, X., Zhang, Y., **Li, J.**, Hsu, K., & Sorooshian, S. (2025). Fine-tuning long short-term memory models for seamless transition from historical to near-real-time streamflow predictions. ***Environmental Modeling & Software***, 106350. [DOI: 10.1016/j.envsoft.2025.106350]

2025 Jiao, Y., Hsu, K., **Li, J.**, & Duan, X. (2025). A multi-task deep learning model for bias correction and merging of precipitation data in the Lancang-Mekong River Basin. ***Journal of Hydrology***, 134026. [DOI: 10.1016/j.jhydrol.2025.134026]

In Preparation

Li, J., Ushijima, H., Hsu, K. L., & Sorooshian S. Overcoming the data scarcity in landslide susceptibility and forecasting modeling. *Plan to submit* to *Nature Water*.

Li, J., Hsu, K., Analui, B., Knofczynski, J. D., & Sorooshian, S. Improving Reservoir operation using Deep Reinforcement Learning. *Plan to submit to Geophysical Research Letters*.

TECHINICAL REPORTS

2024 Analui, B., Sorooshian, S., **Li, J**., Rouzegari, N., Bolboli Zadeh, M., USDOE Office of Energy Efficiency and Renewable Energy (EERE), Renewable Power Office. Water Power Technologies Office HydroWIRES initiative DOE-UCI-08943: Identifying Hydropower Operational Flexibilities in Presence of Streamflow and Net-Load Uncertainty. Final Project Report 2023. [https://doi.org/10.2172/2340918]

CONFERENCE PRESENTATION (3 Oral presentations + 2 eLightning presentations + 2 Poster)

2024 **Li, J**., Hsu, K., & Sorooshian, S. (2024). Foundation model for global natural hazards prediction. AGU Fall Meeting 2024. **eLightning presentation**

2024 **Li, J.**, Hsu, K., Jiang, A. L., & Sorooshian, S. (2022). Improving Rainfall-Runoff Modeling Using Attention-based Model: A Perspective on Explainability. 1st *Science Understanding through Data Science Conference (SUDS)*. **Oral presentation**

2023 **Li, J.**, Analui, B., Hsu, K., & Sorooshian, S. (2023). Deep reinforcement learning for sustainable reservoir operation. *AGU Fall Meeting 2023*. **eLightning presentation**

2022 **Li, J.**, Hsu, K., Jiang, A. L., & Sorooshian, S. (2022). Attention-based model for rainfall-runoff modeling using large-domain datasets. *AGU Fall Meeting 2022*. **Oral presentation**

2022 **Li, J.**, Hsu, K., Jiang, A. L., & Sorooshian, S. (2022). Exploration of Attention-based model for rainfall-runoff modeling. *HydroML symposium 2022*. **Oral presentation**

2022 Dao, V., **Li, J**., Analui, B., & Hsu, K. (2022). Missouri River Basin streamflow simulation using meteorological data. *AGU Fall Meeting 2022*. **Poster presentation**

2020 **Li, J.**, Hsu, K., & Jiang, A. L. (2020). Applying deep learning models for catchment scale streamflow prediction. *AGU Fall Meeting 2020*. **Poster presentation**

APPOINTMENTS & SERVICES

2024 Teaching assistant. Modeling, Economics, and Management (Undergraduate). UCI
2024 Teaching assistant. Civil Engineering Practicum II (Undergraduate). UCI
2023 Teaching assistant. Mathematical Methods in Engineering Analysis (Graduate). UCI
2023 Teaching assistant. Hydro Remote Sensing (Graduate). UCI
2022 Teaching assistant. Mathematical Methods in Engineering Analysis (Graduate). UCI
2022 Teaching assistant. Hydro Remote Sensing (Graduate). UCI
2022 Grader. Civil Engineering Practicum II (Undergraduate). UCI
2021 Mentor. UCI-Connected Education Club. UCI

TECHNICAL SKILLS

Programming Languages: Python, SQL, MATLAB, R
Libraries: PyTorch, TensorFlow, Numba, GDAL, Xarray, Geopandas, Rasterio, OpenAI Gym
Tools: Linux, ArcGIS, ENVI, AutoCAD, AWS, Google Earth, Google Colab