Dapeng Feng

Assistant Professor
Department of Earth and Planetary Sciences
The University of Texas at Austin
2275 Speedway Room 3.136, Austin, TX 78712
dapeng.feng@jsg.utexas.edu

EDUCATION

The Pennsylvania State University — *University Park, USA*
Doctor of Philosophy in Civil Engineering (Hydrology) — Aug 2018 – Aug 2023

Peking University — *Beijing, China*
Master of Engineering in Energy and Resources Engineering (Water Resources) — Sep 2015 – Jul 2018

Wuhan University — *Wuhan, China*
Bachelor of Engineering in Hydraulic Engineering — Sep 2011 – Jun 2015

PROFESSIONAL APPOINTMENT

The University of Texas at Austin — *Austin, USA*
Assistant Professor — Jan 2026 –

Stanford University — *Stanford, USA*
Earth System Science Postdoctoral Scholar — Aug 2023 – Dec 2025
Human-Centered Artificial Intelligence Postdoctoral Fellow — Aug 2023 – Jul 2024

AWARDS & HONORS

***Water Resources Research* Top Downloaded Article** — 2024
Feng et al., 2022

HAI Postdoctoral Fellowship — 2023
Institute for Human-Centered Artificial Intelligence, Stanford University

Editors' Choice Award, *Water Resources Research* — 2023
Ma, Feng et al., 2021

***Water Resources Research* Top Cited Article** — 2023
Ma, Feng et al., 2021

Young Scientists Summer Program Fellowship — 2022
International Institute for Applied Systems Analysis (IIASA)

***Water Resources Research* Top Cited Article** — 2022
Feng et al., 2020

C. Norwood Wherry Memorial Graduate Fellowship in Engineering — 2021
College of Engineering, Penn State University

James E. Marley Graduate Fellowship in Engineering — 2020
College of Engineering, Penn State University

University Graduate Fellowship — 2018
Penn State University

PUBLICATIONS

Citations: 3603 H index: 18 as of September 2026 (Google Scholar)

21) Abbas, A., Yang, Y., Pan, M., Tramblay, Y., Shen, C., Ji, H., ... & Beck, H. E. (including **Feng, D.**) (2026). Comprehensive global assessment of 24 gridded precipitation datasets across 18 428 catchments using hydrological modeling. ***Hydrology and Earth System Sciences***, *30*(11), 3399-3423.

20) Yang, Y., Pan, M., **Feng, D.**, Xiao, M., Dixon, T., Hartman, R., ... & Ralph, F. M. (2025). Improving streamflow simulation through machine learning-powered data integration and its potential for forecasting in the Western US. ***Hydrology and Earth System Sciences***, *29*(20), 5453-5476.

19) Yang, Y., **Feng, D.**, Beck, H. E., Hu, W., Abbas, A., Sengupta, A., et al. (2025). Global daily discharge estimation based on grid long short-term memory (LSTM) model and river routing. ***Water Resources Research***, 61, e2024WR039764.

18) McCormick, E. L., Famiglietti, C. A., **Feng, D.**, Michalak, A. M., & Konings, A. G. (2025). Susceptibility to photosynthesis suppression from extreme storms is highly Site-Dependent. ***Global Change Biology***, *31*(5), e70257.

17) **Feng, D.**, Beck, H., de Bruijn, J., Sahu, R., Satoh, Y., Wada, Y., Liu, J., Pan, M., Lawson, K., & Shen, C. (2024). Deep dive into hydrologic simulations at global scale: harnessing the power of deep learning and physics-informed differentiable models (δHBV-globe1.0-hydroDL). ***Geoscientific Model Development***, *17*(18), 7181-7198.

16) Song, Y., Knoben, W. J., Clark, M. P., **Feng, D.**, Lawson, K., Sawadekar, K., & Shen, C. (2024). When ancient numerical demons meet physics-informed machine learning: adjoint-based gradients for implicit differentiable modeling. ***Hydrology and Earth System Sciences***, *28*(13), 3051-3077.

15) Reichert, P., Ma, K., Höge, M., Fenicia, F., Baity-Jesi, M., **Feng, D.**, & Shen, C. (2023). Metamorphic testing of machine learning and conceptual hydrologic models. ***Hydrology and Earth System Sciences***, 28(11), 2505–2529.

14) Bindas, T., Tsai, W. P., Liu, J., Rahmani, F., **Feng, D.**, Bian, Y., ... & Shen, C. (2024). Improving river routing using a differentiable Muskingum-Cunge model and physics-informed machine learning. ***Water Resources Research***, *60*(1), e2023WR035337.

13) Rahmani, F., Appling, A., **Feng, D.,** Lawson, K., & Shen, C. (2023). Identifying structural priors in a hybrid differentiable model for stream water temperature modeling. ***Water Resources Research***, 59, e2023WR034420.

12) Shen, C., Appling, A. P., Gentine, P., Bandai, T., Gupta, H., Tartakovsky, A., ... & Lawson, K. (including **Feng, D.**) (2023). Differentiable modelling to unify machine learning and physical models for geosciences. ***Nature Reviews Earth & Environment***, 1-16.

11) **Feng, D.**, Beck, H., Lawson, K., & Shen, C. (2023). The suitability of differentiable, physics-informed machine learning hydrologic models for ungauged regions and climate change impact assessment. ***Hydrology and Earth System Sciences***, *27*(12), 2357-2373.

10) Yao, Y., Zhao, Y., Li, X., **Feng, D.**, Shen, C., Liu, C., ... & Zheng, C. (2023). Can transfer learning improve hydrological predictions in the alpine regions?. ***Journal of Hydrology***, 625, 130038.

9) **Feng, D.**, Liu, J., Lawson, K., & Shen, C. (2022). Differentiable, learnable, regionalized process-based models with multiphysical outputs can approach state-of-the-art hydrologic prediction accuracy. ***Water Resources Research,*** 58, e2022WR032404. (***Top downloaded article 2022-2023***)

8) Fang, K., Kifer, D., Lawson, K., **Feng, D.**, & Shen, C. (2022). The data synergy effects of time-series deep learning models in hydrology. ***Water Resources Research****, 58*, e2021WR029583.

7) Tsai, W.-P., **Feng, D.**, Pan, M., Beck, H., Lawson, K., Yang, Y., Liu, J., & Shen, C. (2021). From calibration to parameter learning: Harnessing the scaling effects of big data in geoscientific modeling. ***Nature Communications****, 12*(1), 5988.

6) **Feng, D.**, Lawson, K., & Shen, C. (2021). Mitigating prediction error of deep learning streamflow models in large data-sparse regions with ensemble modeling and soft data. ***Geophysical Research Letters****, 48*(14), e2021GL092999.

5) Ma, K., **Feng, D.**, Lawson, K., Tsai, W.-P., Liang, C., Huang, X., Sharma, A., & Shen, C. (2021). Transferring hydrologic data across continents – Leveraging data-rich regions to improve hydrologic prediction in data-sparse regions. ***Water Resources Research**, 57*(5), e2020WR028600. (***Top cited article 2021-2022*; *Editor's Choice Award***)

4) Zhi, W., **Feng, D.**, Tsai, W.-P., Sterle, G., Harpold, A., Shen, C., & Li, L. (2021). From hydrometeorology to river water quality: Can a deep learning model predict dissolved oxygen at the continental scale? ***Environmental Science & Technology**, 55*(4), 2357–2368.

3) Ouyang, W., Lawson, K., **Feng, D.**, Ye, L., Zhang, C., & Shen, C. (2021). Continental-scale streamflow modeling of basins with reservoirs: Towards a coherent deep-learning-based strategy. ***Journal of Hydrology**, 599*, 126455.

2) **Feng, D.**, Fang, K., & Shen, C. (2020). Enhancing streamflow forecast and extracting insights using long-short term memory networks with data integration at continental scales. ***Water Resources Research**, 56*(9), e2019WR026793. (***Top cited article 2020-2021***)

1) **Feng, D.**, Zheng, Y., Mao, Y., Zhang, A., Wu, B., Li, J., Tian, Y., & Wu, X. (2018). An integrated hydrological modeling approach for detection and attribution of climatic and human impacts on coastal water resources. ***Journal of Hydrology**, 557*, 305–320.

REPORTS

Varadharajan, C., Painter, S. L., Kumar, J., Shen, C., Lu, D., Moulton, D., Chen, X., Ombadi, M., **Feng, D.,** Bhanja, S., Weierbach, H., Tsai, W., Willard J., Zhi W., & Sun A. (2022). Chapter 3: Hydrology, in Hickmon et al., **Artificial Intelligence for Earth System Predictability (AI4ESP)** (DOE Workshop Report).

OPEN SOURCE SOFTWARE

- **Feng, D.**, Shen, C., Liu, J., Lawson, K., & Beck, H. (2022). differentiable parameter learning (dPL) + HBV hydrologic model. Zenodo. https://doi.org/10.5281/zenodo.794362

  *This model software has been downloaded **more than 3000 times** since released in September 2022.*
- Fang, K., Shen, C., & **Feng, D.** (2021). mhpi/hydroDL: MHPI-hydroDL (v2.0). Zenodo. https://doi.org/10.5281/zenodo.5015120

INVITED AND PLENARY PRESENTATIONS

- **Feng, D.**, (2025). Empowering land surface modeling via differentiable hybrid physics-machine learning models. *Advancing Land Modeling for Gulf Coast Resilience Workshop.* Austin, TX, USA. (Invited keynote)
- **Feng, D.**, (2025). Autonomous learning of large-scale watershed functions: from big data via hybrid differentiable Modeling. *Creating Synthesis out of Complexity in Catchment Science*, Gordon Research Conference. New Hampshire, USA. (Invited)
- **Feng, D.**, (2024). Unifying physical models and deep learning for large-scale hydrologic simulation and knowledge discovery. Watershed Dynamics and Hydrological Extremes Group, Department Catchment Hydrology, Helmholtz Centre for Environmental Research - UFZ. (Invited, delivered online)
- **Feng, D.**, (2024). Unifying physical models and deep learning for large-scale hydrologic simulation and knowledge discovery. Department of Earth, Marine and Environmental Sciences, University of North Carolina at Chapel Hill, NC, USA. (Invited)

- **Feng, D.,** Shen, C., Beck, H., de Bruijn, J., Sahu, R. K., Satoh, Y., Wada, Y., ... & Lawson, K. (2023). Harnessing the power of deep learning and physics-informed differentiable models for accurate global hydrologic modeling. *American Geophysical Union Fall Meeting*. San Francisco, CA, USA. (Invited 20-minute long talk)
- **Feng, D.**, (2023). Differentiable hydrologic models: unifying deep learning and physical models for large scale simulation. Center for Western Weather and Water Extremes, Scripps Institution of Oceanography, UC San Diego, La Jolla, CA, USA. (Invited)
- **Feng, D.**, (2023). Hydrologic deep learning and its integration with physics using differentiable modeling. Remote Sensing Ecohydrology Group, Department of Earth System Science, Stanford University, Stanford, CA, USA. (Invited)
- **Feng, D.**, (2022). Hydrologic deep learning and its integration with physical models. Department Systems Analysis, Integrated Assessment and Modelling, Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland. (Invited)
- **Feng, D.**, Shen, C., Liu, J., & Lawson, K., (2022). Differentiable, learnable, regionalized process-based models with physical outputs can approach state-of-the-art hydrologic prediction accuracy. *HydroML Symposium.* State College, PA, USA. (Plenary)

SELECTED FIRST AUTHOR PRESENTATIONS

- **Feng, D.**, & Shen, C. (2024). Differentiable, Hybrid Hydrologic Modeling to Inform Structure Learning and Elucidate Hydrologic Functions. *American Geophysical Union Fall Meeting*. Washington, D.C., USA (Oral)
- **Feng, D.**, Holtzman, N., Liu, Y., Tan, Z., Anderson, M., Holmes, T. R., ... & Konings, A. G. (2024). Multi-source Remote Sensing Data Integration to Characterize Plant-Water Interactions via Differentiable, Physics-Informed Machine Learning. *American Geophysical Union Fall Meeting*. Washington, D.C., USA (Oral)
- **Feng, D.**, Holtzman, N., Liu, Y., Tan, Z., & Konings, A. G. (2024). Physics-Informed Differentiable Modeling for Learning Hydrologic Functions from Large Observations. *The Conference on Computational Methods in Water Resources 2024*. (Oral, delivered online)
- **Feng, D.**, Holtzman, N., Liu, Y., Tan, Z., & Konings, A. G. (2024). Global-scale retrievals of leaf water potential using physics-informed machine learning and remote sensing data integration. *HydroML Symposium.* Richland, WA, USA. (Oral)
- **Feng, D.**, Shen, C., Li, L., & Sadayappan, K. (2023). Differentiable modeling towards integrating physics and machine Learning provides valuable opportunities for learning hydrologic functions and knowledge from large Data. *American Geophysical Union Fall Meeting*. San Francisco, CA, USA. (Oral)
- **Feng, D.**, & Shen, C. (2023). A differentiable modeling approach to systematically integrating deep learning and physical models for large scale hydrologic prediction and knowledge discovery. *HydroML Symposium.* Berkeley, CA, USA. (Oral)
- **Feng, D.**, Shen, C., Liu, J., & Lawson, K. (2022). Parameter learning to structure evolution: a deep integration of physical models and deep learning to improve hydrologic modeling at large scales. *American Geophysical Union Fall Meeting*. Chicago, IL, USA. (Oral)
- **Feng, D.**, & Shen, C. (2021). The value of deep learning to the future SWOT mission for improving predictions in ungauged basins. *American Geophysical Union Fall Meeting.* New Orleans, LA, USA. (eLightning)
- **Feng, D.**, & Shen, C. (2020). Leveraging flow duration information to improve streamflow prediction in data-sparse regions with deep learning models. *American Geophysical Union Fall Meeting*. Online. (Poster)
- **Feng, D.**, Shen, C., & Fang, K. (2020). Multisource data integration under a deep learning framework to improve streamflow forecast ability. *100th American Meteorological Society Annual Meeting*. Boston, MA, USA. (Oral)

- **Feng, D.**, Shen, C., & Fang, K. (2019). A flexible deep learning data integration framework to improve streamflow forecast and provide hydrologic insights over the continental US. *American Geophysical Union Fall Meeting*. San Francisco, CA, USA. (Oral)

ACADEMIC ACTIVITIES

- Flood Forecasting Meets Machine Learning Workshop. Google, online. January, 2023.
- Young Scientists Summer Program. International Institute for Applied Systems Analysis, Vienna, Austria. June-August, 2022.
- Artificial Intelligence for Earth System Predictability (AI4ESP). U.S. Department of Energy, online. November, 2021.
- Scientific Focus Area (SFA) Community Watershed Workshop. Pacific Northwest National Laboratory, Richland, WA, USA. September, 2019.
- Geo for Good Summit. Google, Sunnyvale, CA, USA. September, 2019.
- CUAHSI-NCAR Training Workshop: The Community WRF-Hydro Modeling System. National Center for Atmospheric Research (NCAR), Boulder, CO, USA. June, 2019.
- Runoff Predictions in Ungauged Basins (PUB). International Summer School. Vienna University of Technology, Vienna, Austria. July, 2017.
- Modeling Environment Resilience. International Summer School. École Normale Supérieure, Paris, France. June, 2016.

SERVICE

- Panelist for NASA review panel, proposal reviewer for German Research Foundation
- Associate editor: *Water Resources Research*
- Reviews for scientific journals: *Geophysical Research Letters, Water Resources Research, Journal of Hydrology, Environmental Modelling & Software, Hydrology and Earth System Sciences, Hydrological Processes, Scientific Reports, IEEE Transactions on Geoscience and Remote Sensing, Earth's Future, Biogeosciences*
- Organizing committee member for the inaugural HydroML Symposium, May 2022
- Co-chair for the upcoming fifth HydroML Symposium, May 2026
- Co-convener for the session on Explainable and Hybrid Machine Learning in Hydrology in the EGU General Assembly 2024, 2025