

Lijing Wang

CONTACT INFORMATION

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RESEARCH INTERESTS

Bayesian inversion, non-stationary geostatistics, computer vision in geomodeling

EDUCATION

Stanford University, Stanford, CA

Ph.D. in Geological Sciences, advised by Prof. Jef Caers. 2017 - present
Ph.D. minor in Computer Science 2021 - present

Peking University, Beijing, China

B.S. in Space Physics 2013 - 2017
B.S. in Applied Mathematics 2014 - 2017

Hong Kong University of Science and Technology, Hong Kong, China

Exchange program in Physics with full-tuition scholarship, Dean's list 2014

RESEARCH EXPERIENCE

Ph.D. Candidate, Stanford University 2017 - present

- Data Science Scholar at Stanford Data Science Institute, 2020 - 2022 cohort
- Ph.D. candidate at Stanford Center for Earth Resources Forecasting

Research projects:

- Hierarchical Bayesian inversion of global variables and large-scale spatial fields
- Quantifying uncertainty of subsurface systems using multiple data sources: direct geological cores, indirect geophysical data and geological constraints
- 3D geomodeling using computer vision methods: implicit level-sets method, semantic segmentation using deep convolutional neural networks (CNN)
- Uncertainty quantification of water exchanges due to beaver-induced inundation

Data Science for Social Good projects:

- *Urban inequality*: Measuring spatial-temporal change of physical conditions in neighborhoods with street view imagery
- *Agricultural monitoring and food security*: Semantic segmentation of crop type in Africa
- *Natural hazard research*: Landslides susceptibility assessment in California, reducing sampling bias of landslides by identifying unrecorded events from satellite images
- *Covid-19 study design*: Covid-19 Serology Study Design and Exploration

Technical mentor, Stanford Data Science for Social Good April 2021 - Aug 2021

- Quantitatively measuring physical aspects of urban neighborhood environments from street view imagery data using computer vision recognition tools
- Designing computer vision tutorials for student fellows
- Leading and advancing student fellows to achieve project goals

Data Science Intern, TotalEnergies

Jun 2020 - Sep 2020

- AI & Geosciences Program: based in Google Cloud Advanced Solutions Lab

- Developed a semi-supervised learning framework to optimize geophysical data interpretation with limit labels
- Active Learning to aid experts' geophysical interpretation

Guest Ph.D., Hydrogeophysics Group, Aarhus University Jun 2019 - Aug 2019

- 3D modeling of geological structures given towed electromagnetic (tTEM) surveys: uncertainty assessment and quantification

Research Assistant, Peking University

Jun 2016 - Apr 2017

- Detecting the air pollution level (PM2.5) in Beijing using crowd-sourcing photos
- Precision medicine: drug sensitivity prediction

Research Intern, Stanford University

Jun 2016 - Sep 2016

- Functional Data Analysis with incomplete production data in unconventional reservoirs.

Research Intern, University of California, Berkeley (Berkeley, CA)

Jun 2015 - Sep 2015

- Urban foraging's contribution to nutrition: correlation between urban foraging knowledge and demographic variables

BOOKS

Wang, L., Yin, Z., Caers, J., Data Science for the Geosciences, Cambridge University Press, 2022 (in preparation)

JOURNAL PUBLICATIONS

Wang, L., Perzan, Z., Babey, T., Briggs, M., Pierce, S., Rogers, B., Bargar, J., Maher, K., , Uncertainty quantification of water exchanges due to beaver-induced inundation, 2021 (in preparation)

Wang, L., Peeters, L., MacKie, E.J., Caers, J., Stochastic sampling of non-stationary geological interfaces accounting for geological realism, 2021 (in preparation)

Wang, L., Kitanidis, P., Caers, J., Hierarchical Bayesian inversion of global variables and large-scale spatial fields, *Water Resources Research*, 2021 (under review)

Wang, L., Joncour, F., Barrallon, P., Harribey, T., Castanie L., Yousfi S., Guillon S., Semi-supervised semantic segmentation for seismic interpretation, *Geophysics*, 2021 (under review)

Caers, J., Scheidt, C., Yin, Z., **Wang, L.**, Mukerji, T., House, K., Efficacy of information in mineral exploration drilling, *Natural Resources Research*, 2021 (under review)

Hall, T., Scheidt, C., **Wang, L.**, Yin, Z., Mukerji, T., Caers, J., Sequential value of information for subsurface exploration drilling, *Natural Resources Research*, 2021 (under review)

Miltenberger, A., Uhlemann, S., Mukerji, T., Williams, K., Dafflon, B., **Wang, L.**, Murakami-Wainwright, H., Probabilistic evaluation of geoscientific hypotheses with geophysical data: application to electrical resistivity imaging of a fractured bedrock zone, *Journal of Geophysical Research - Solid Earth*, 2021

Johnston, E., Davenport, F., **Wang, L.**, Caers, J., Muthukrishnan, S., Burke, M., Diffenbaugh, N., Quantifying the influence of precipitation intensity on landslide hazard in urbanized and non-urbanized areas, *Geophysical Research Letters*, 2021

Li, Q., **Wang, L.**, Perzan, Z., Caers, J., Brown G., Bargar, J., Maher K., Global sensitivity analysis of a reactive transport model for mineral scale formation during hydraulic fracturing, *Environmental Engineering Science*, 2021

CONFERENCE PUBLICATIONS	M Rustowicz, R., Cheong, R., Wang, L. , Ermon, S., Burke, M., Lobell, D. , Semantic segmentation of crop type in Africa: A novel dataset and analysis of deep learning methods, <i>Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops</i> , 2019	
PRESENTATION AND POSTER	<p>Wang, L., Perzan, Z., Babey, T., Briggs, M., Pierce, S., Rogers, B., Bargar, J., Maher, K., , Uncertainty quantification of water exchanges due to beaver-induced inundation, <i>American Geophysical Union, Fall Meeting 2021</i> [Oral]</p> <p>MacKie, E.J., Wang, L., Schroeder, D.M. , Zuo, C., Yin, Z., Caers, J., Hibbs, M., The parallel worlds of DEMOGORGN Greenland, <i>American Geophysical Union, Fall Meeting 2021</i> [Oral]</p> <p>Babey, T., Perzan, Z., Rogers, B., Wang, L., Pierce, S., Bargar, J., Maher, K., Hydro-biogeochemical response of oxic-anoxic interfaces to beaver dam construction in a simulated floodplain aquifer, <i>American Geophysical Union, Fall Meeting 2021</i> [Poster]</p> <p>Wang, L., Vilhelmsen, T. N., Caers, J., Local decision making through understanding of multi-scale uncertainty: Application to well catchment protections in Denmark <i>Computational Methods in Water Resources</i>, 2020 [Oral]</p> <p>Wang, L., Peeters, L., Caers, J.,, Uncertainty assessment of hydrogeological structures combining geophysical survey and geological knowledge: A stochastic level set optimization framework, <i>American Geophysical Union, Fall Meeting 2020</i> [Oral]</p> <p>Wang, L., Vilhelmsen, T. N., Caers, J., Direct forecasting of local hydraulic conductivity using combined geophysical and hydrological data: Application to well catchment predictions in Danish aquifer system, <i>American Geophysical Union, Fall Meeting 2019</i> [Poster]</p> <p>Wang, L., Vilhelmsen, T. N., Caers, J., Joint Uncertainty Quantification on Spatial and Global Hydrogeological Models: An Application to Danish Groundwater Management, <i>American Geophysical Union, Fall Meeting 2018</i> [Poster]</p> <p>Johnston, E. C., Caers, J., Wang, L., Davenport, F. V., Muthukrishnan, S., Diffenbaugh, N. S., Multi-scale signatures of climate change on landslide susceptibility: a case study for the Pacific Coast of the United States, <i>American Geophysical Union, Fall Meeting 2018</i> [Poster]</p> <p>Wang, L., Grujic, O., Caers, J., Reconstruction and Forecasting Oil Rates Using Functional Data Analysis and Universal Co-Kriging, <i>NGI Industrial Affiliates Meeting, Stanford University, 2017</i> [Poster]</p> <p>Wang, L., Yao, Y., Tang, Y., A Statistical Learning Approach for Drug Sensitivity Prediction with Cancer Cell Line Data, <i>Data Science and Computational Precision Health</i>, 2017 [Poster]</p> <p>Wang, L., Grujic, O., Caers, J., Statistical Learning on Incomplete Production Profiles of Unconventional Reservoirs, <i>NGI Industrial Affiliates Meeting, Stanford University, 2016</i> [Poster]</p>	
TEACHING AND MENTORING	<ul style="list-style-type: none"> • Data Science for Social Good Program Technical mentor • GEOLSCI 6: Data Science for Geoscience Co-designer/Teaching Assistant 	<p>Spring 2021 - Summer 2021 Stanford Data Science Institute</p> <p>Winter 2021 Stanford University</p>

	<ul style="list-style-type: none"> • GEOLSCI 240: Data Science for Geoscience Teaching Assistant Winter 2019 Stanford University • Data Analysis and Business Value Teaching Assistant Spring 2017 Peking University 	
SERVICE	Student representative for Stanford Earth DEI (Diversity, Equity, Inclusion) Advisory Council 2021 Graduate panelist for Stanford Earth IDEAL (Inclusion, Diversity, Equity, and Access) faculty search 2021 Co-president in Association of Chinese Students and Scholars at Stanford 2019-2020 Student organizing committee, Women in Data Science (WiDS) @ Stanford Earth 2019	
HONORS AND AWARDS	Society for Industrial and Applied Mathematics (SIAM) Travel Awards 2021 Stanford Data Science Scholars Program Fellowship 2020-2022 GS Travel Fund 2021 2020 Harriet Benson Fellowship Award 2020 2nd Prize in Stanford Big Earth Hackathon 2018 Meritorious in COMAP's Mathematical Contest in Modeling 2016 Houston BAA Scholarship 2016 Guanghua Scholarship 2014, 2015 Dean's list in School of Science, HKUST 2014	
TECHNICAL SKILLS	Languages: Python, R, MATLAB, C/C++ Deep Learning Framework: TensorFlow, Keras Other Software: L ^A T _E X, Jupyter, Google Cloud Platform	