

# Lijing Wang

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RESEARCH INTERESTS	Bayesian inversion, non-stationary geostatistics, computer vision in geomodeling, data science in geosciences	
EDUCATION	<b>Stanford University</b> , Stanford, CA	
	Ph.D. in Geological Sciences, advised by Prof. Jef Caers.	2017 - present
	Ph.D. minor in Computer Science	2021 - present
	<b>Peking University</b> , Beijing, China	
	B.S. in Space Physics	2013 - 2017
	B.S. in Applied Mathematics	2014 - 2017
	<b>Hong Kong University of Science and Technology</b> , Hong Kong, China	
	Exchange program in Physics with full-tuition scholarship, Dean's list	2014
RESEARCH EXPERIENCE	<b>Ph.D. Candidate, Stanford University</b>	2017 - present
	<ul style="list-style-type: none"><li>• Data Science Scholar at Stanford Data Science Institute, 2020 - 2022 cohort</li><li>• Ph.D. candidate at Stanford Center for Earth Resources Forecasting</li></ul>	
	Research projects:	
	<ul style="list-style-type: none"><li>• <i>Uncertainty quantification and data calibration methods</i>: Hierarchical Bayesian inference of global variables and large-scale spatial fields, focusing on hydrologic models</li><li>• <i>Geomodeling using computer vision methods, with geophysical imaging and domain knowledge</i>: Stochastic sampling of non-stationary geological interfaces accounting for geological realism</li><li>• <i>Spatial-temporal water exchanges in floodplain systems</i>: Uncertainty quantification of water exchanges due to beaver-induced inundation in an Intermountain Floodplain Aquifer</li></ul>	
	Data Science for Social Good projects:	
	<ul style="list-style-type: none"><li>• <i>Urban inequality</i>: Measuring spatial-temporal change of physical conditions in neighborhoods with street view imagery</li><li>• <i>Agricultural monitoring and food security</i>: Semantic segmentation of crop type in Africa</li><li>• <i>Natural hazard research</i>: Landslides susceptibility assessment in California, reducing sampling bias of landslides by identifying unrecorded events from satellite images</li><li>• <i>Covid-19 study design</i>: Covid-19 Serology Study Design and Exploration</li></ul>	
	<b>Technical mentor, Stanford Data Science for Social Good</b> April 2021 - Aug 2021	
	<ul style="list-style-type: none"><li>• Quantitatively measuring physical aspects of urban neighborhood environments from street view imagery data using computer vision recognition tools</li><li>• Designing computer vision tutorials for student fellows</li></ul>	

- 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
- Quantified uncertainty of the semi-supervised learning framework in order to do active learning and help experts' sequential geophysical interpretations

**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.,** Kim, H., Vilhelmsen, T. N., Christiansen, A. V., Hansen, B., Caers, J., Uncertainty quantification of 3D subsurface redox architecture from non-collocated redox borehole and transient electromagnetic data, *Hydrogeology Journal*, 2022 (in preparation)

**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, 2022 (in preparation)

**Wang, L.,** Peeters, L., MacKie, E.J., Caers, J., Stochastic sampling of non-stationary geological interfaces accounting for geological realism, 2022 (in preparation)

**Wang, L.,** Kitanidis, P., Caers, J., Hierarchical Bayesian inversion of global variables and large-scale spatial fields, *Water Resources Research*, 2022

**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

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, *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*, 2019

PRESENTATION AND  
POSTER

**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, *American Geophysical Union, Fall Meeting 2021* [Oral]

MacKie, E.J., **Wang, L.**, Schroeder, D.M. , Zuo, C., Yin, Z., Caers, J., Hibbs, M., The parallel worlds of DEMOGORGN Greenland, *American Geophysical Union, Fall Meeting 2021* [Oral]

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, *American Geophysical Union, Fall Meeting 2021* [Poster]

**Wang, L.**, Peeters, L., Caers, J., Quantifying uncertainty of non-stationary geological interfaces: Metropolis-Hasting sampling of implicit level sets, *SIAM Conference on Mathematical Computational Issues in the Geosciences, 2021* [Oral]

**Wang, L.**, Vilhelmsen, T. N., Caers, J., Local decision making through understanding of multi-scale uncertainty: Application to well catchment protections in Denmark *Computational Methods in Water Resources, 2020* [Oral]

**Wang, L.**, Peeters, L., Caers, J., Uncertainty assessment of hydrogeological structures combining geophysical survey and geological knowledge: A stochastic level set optimization framework, *American Geophysical Union, Fall Meeting 2020* [Oral]

**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, *American Geophysical Union, Fall Meeting 2019* [Poster]

**Wang, L.**, Vilhelmsen, T. N., Caers, J., Joint Uncertainty Quantification on Spatial and Global Hydrogeological Models: An Application to Danish Groundwater Management, *American Geophysical Union, Fall Meeting 2018* [Poster]

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, *American Geophysical Union, Fall Meeting 2018* [Poster]

**Wang, L.**, Grujic, O., Caers, J., Reconstruction and Forecasting Oil Rates Using Func-

tional Data Analysis and Universal Co-Kriging, *NGI Industrial Affiliates Meeting, Stanford University, 2017* [Poster]

**Wang, L.**, Yao, Y., Tang, Y., A Statistical Learning Approach for Drug Sensitivity Prediction with Cancer Cell Line Data, *Data Science and Computational Precision Health, 2017* [Poster]

**Wang, L.**, Grujic, O., Caers, J., Statistical Learning on Incomplete Production Profiles of Unconventional Reservoirs, *NGI Industrial Affiliates Meeting, Stanford University, 2016* [Poster]

TEACHING AND MENTORING	• Data Science for Social Good Program Technical mentor	Spring 2021 - Summer 2021 Stanford Data Science Institute
	• GEOLSCI 6: Data Science for Geoscience Co-designer/Teaching Assistant	Winter 2021 Stanford University
	• GEOLSCI 240: Data Science for Geoscience Teaching Assistant	Winter 2019, Winter 2022 Stanford University
	• Data Analysis and Business Value Teaching Assistant	Spring 2017 Peking University
SERVICE	Student DEI leader representative, Stanford Earth	2021-2022
	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) at 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 2022	2022
	GS Travel Fund 2021	2021
	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
TECHNICAL SKILLS	Dean's list in School of Science, HKUST	2014
	Languages: Python, R, MATLAB, C/C++	
	Deep Learning Framework: TensorFlow, Keras	
	Other Software: L <sup>A</sup> T <sub>E</sub> X, Jupyter, Google Cloud Platform	