

Lijing Wang

CONTACT INFORMATION

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RESEARCH INTERESTS

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

EDUCATION

Stanford University, Stanford, CA

Ph.D. in Geological Sciences, advised by Prof. Jef Caers. Sep 2017 - present

Peking University, Beijing, China

B.S. in Space Physics Jul 2017

B.S. in Applied Mathematics Jul 2017

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

Exchange program in Physics with full-tuition scholarship Dec 2014

RESEARCH EXPERIENCE

Ph.D. Candidate, Stanford University (Stanford, CA) Sep 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 multi data sources: geophysical data and geological constraints
- 3D geomodeling using computer vision methods: implicit level-sets method, semantic segmentation using deep convolutional neural networks (CNN).

Other 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 (Stanford, CA)

- 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, Total E&P Research and Technology Jun 2020 - Sep 2020 (Sunnyvale, CA)

- 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
(Aarhus, Denmark)

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

Research Assistant, Peking University (Beijing, China) 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 (Stanford, CA) 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

JOURNAL
PUBLICATIONS

Wang, L., Peeters, L., MacKie, E.J., Caers, J., Quantifying Uncertainty of Non-Stationary Geological Interfaces: Metropolis-Hasting Sampling of Implicit Level Sets, 2021 (in preparation)

Wang, L., Kitanidis, P., Caers, J., Hierarchical Bayesian inversion of global variables and large-scale spatial fields, 2021 (in preparation)

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)

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., Vilhelmsen, T. N., Caers, J., Local decision making through understanding of multi-scale uncertainty: Application to well catchment protections in Denmark, oral presentation, *Computational Methods in Water Resources* (CMWR 2020)

Wang, L., Peeters, L., Caers, J., Uncertainty assessment of hydrogeological struc-

tures combining geophysical survey and geological knowledge: A stochastic level set optimization framework, *American Geophysical Union*, oral presentation, Fall Meeting 2020

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

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

Johnston, E. C., Caers, J., **Wang, L.**, Davenport, F. V., Muthukrishnan, S., Diffebaugh, 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

Wang, L., Grujic, O., Caers, J., Reconstruction and Forecasting Oil Rates Using Functional Data Analysis and Universal Co-Kriging, *NGI Industrial Affiliates Meeting*, Stanford University, 2017

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

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

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
Stanford University
- Data Analysis and Business Value Teaching Assistant Spring 2017
Peking University

SERVICE

- 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 @ 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^AT_EX, Jupyter, Google Cloud Platform