

Sherrie Wang

CONTACT INFORMATION

Global Policy Lab
2607 Hearst Ave
Berkeley, CA 94720

E-mail: sherwang@berkeley.edu
Web: <http://sherriewang.github.io>
Twitter: @sherwang

APPOINTMENTS

d'Arbeloff Career Development Assistant Professor, starting Spring 2023
Department of Mechanical Engineering & Institute for Data, Systems, and Society
Massachusetts Institute of Technology, Cambridge, Massachusetts USA

Ciriacy-Wantrup Postdoctoral Fellow, 2021–present
Host: Solomon Hsiang
Goldman School of Public Policy
University of California, Berkeley, Berkeley, California USA

EDUCATION

Stanford University, Stanford, California USA
Ph.D., Computational and Mathematical Engineering, 2021
Dissertation: “Machine learning for satellite imagery when labels are scarce”
Advisor: David Lobell
M.S., Computational and Mathematical Engineering
Harvard University, Cambridge, Massachusetts USA
A.B. Biomedical Engineering, *Magna cum laude* with high honors, 2014

PREPRINTS

(* denotes equal
contribution)

1. Stefania Di Tommaso, **Sherrie Wang**, Vivek Vajipey, Noel Gorelick, Rob Strey, and David B. Lobell. Annual field-scale maps of tall and short crops at the global scale using gedi and sentinel-2. *Under review*, 2023+
2. A. Patrick Behrer and **Sherrie Wang**. Current benefits of wildfire smoke for yields in the US Midwest may dissipate by 2050. *Under review*, 2023+
3. Marc Russwurm, **Sherrie Wang**, Benjamin Kellenberger, Ribana Roscher, and Devis Tuia. Meta-learning to address diverse earth observation problems across resolutions. *Under review*, 2023+

PEER-REVIEWED PUBLICATIONS

1. **Sherrie Wang**, Francois Waldner, and David B. Lobell. Unlocking large-scale crop field delineation in smallholder farming systems with transfer learning and weak supervision. *Remote Sensing*, 2022
2. Marissa Childs, Jessica Li, Jeffrey Wen, Sam Heft-Neal, Anne Driscoll, **Sherrie Wang**, Carlos Gould, Minghao Qiu, Jennifer Burney, and Marshall Burke. Daily local-level estimates of ambient wildfire smoke PM2.5 for the contiguous US. *Environmental Science & Technology*, 2022
3. Ju Young Lee, **Sherrie Wang**, Anjuli Jain Figueroa, Rob Strey, David B. Lobell, Rosamond L. Naylor, and Steven M. Gorelick. Mapping sugarcane in central India with smartphone crowd-sourcing. *Remote Sensing*, 2022
4. Christopher Yeh*, Chenlin Meng*, **Sherrie Wang***, Anne Driscoll, Erik Rozi, Patrick Liu, Jihyeon Lee, Marshall Burke, David B. Lobell, and Stefano Ermon. SustainBench: Benchmarks for monitoring the Sustainable Development Goals with machine learning. *NeurIPS Datasets and Benchmarks Track*, 2021

Last updated Feb 6, 2023

5. Stefania Di Tommaso, **Sherrie Wang**, and David B. Lobell. Combining GEDI and Sentinel-2 for wall-to-wall mapping of tall and short crops. *Environmental Research Letters*, 2021
6. Dan M. Kluger, **Sherrie Wang**, and David B. Lobell. Two shifts for crop mapping: Leveraging aggregate crop statistics to improve satellite-based maps in new regions. *Remote Sensing of Environment*, 262:112488, 2021
7. **Sherrie Wang**, Stefania Di Tommaso, Joey Faulkner, Thomas Friedel, Alexander Kennepohl, Rob Strey, and David B. Lobell. Mapping crop types in southeast India with smartphone crowdsourcing and deep learning. *Remote Sensing*, 12(18), 2020
8. **Sherrie Wang**, Stefania Di Tommaso, Jillian M. Deines, and David B. Lobell. Mapping twenty years of corn and soybean across the US Midwest using the Landsat archive. *Scientific Data*, 7(1):307, 2020
9. Marc Rußwurm*, **Sherrie Wang***, Marco Körner, and David B. Lobell. Meta-learning for few-shot land cover classification. *2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, pages 788–796, 2020
EarthVision 2020 Best Paper Award
10. **Sherrie Wang**, William Chen, Sang Michael Xie, George Azzari, and David B. Lobell. Weakly supervised deep learning for segmentation of remote sensing imagery. *Remote Sensing*, 12(2), 2020
11. Jillian M. Deines, **Sherrie Wang**, and David B. Lobell. Satellites reveal a small positive yield effect from conservation tillage across the US Corn Belt. *Environmental Research Letters*, 14(12):124038, 2019
12. Neal Jean, **Sherrie Wang**, Anshul Samar, George Azzari, David Lobell, and Stefano Ermon. Tile2Vec: Unsupervised representation learning for spatially distributed data. *Proceedings of the AAAI Conference on Artificial Intelligence*, 33:3967–3974, 2019
13. **Sherrie Wang**, George Azzari, and David B. Lobell. Crop type mapping without field-level labels: Random forest transfer and unsupervised clustering techniques. *Remote Sensing of Environment*, 222:303–317, 2019
14. Lo-Hua Yuan, Anthony Liu, Alec Yeh, Aaron Kaufman, Andrew Reece, Peter Bull, Alex Franks, **Sherrie Wang**, Dmitri Illushin, and Luke Bornn. A mixture-of-modelers approach to forecasting NCAA tournament outcomes. *Journal of Quantitative Analysis in Sports*, 11, 2015

CONFERENCE PRESENTATIONS

1. Sherrie Wang, Stefania Di Tommaso, Vivek Vajipey, Noel Gorelick, Rob Strey, and David B. Lobell. “Global mapping of tall crops in regions without field labels using GEDI and Sentinel-2” *American Geophysical Union Fall Meeting*, 2022 (Presentation)
2. Sherrie Wang, Francois Waldner, and David B. Lobell. “Large-scale agricultural field delineation in India using deep learning and weak supervision” *American Geophysical Union Fall Meeting*, 2022 (Poster)
3. Hikari Murayama, Sherrie Wang, Ron Cohen, and Solomon Hsiang. “Measuring CO2 emissions using deep learning and remote sensing.” *American Geophysical Union Fall Meeting*, 2022 (Poster)
4. Sherrie Wang, Francois Waldner, and David B. Lobell. “Delineating smallholder fields using transfer learning and weak supervision.” *American Geophysical Union Fall Meeting*, 2021 (Presentation)
5. Sherrie Wang, Stefania Di Tommaso, and David B. Lobell. “Combining GEDI and Sentinel-2 for wall-to-wall mapping of tall and short crops.” *American Geophysical Union Fall Meeting*, 2021 (Presentation)

6. Marissa Childs, Jeff Wen, Sam Heft-Neal, Jessica Li, Anne Driscoll, Sherrie Wang, Jennifer Burney, and Marshall Burke. “A tractable model of ambient particulate matter exposure from wildfire smoke.” *American Geophysical Union Fall Meeting*, 2021 (Poster)
7. Jillian M. Deines, Anthony D. Kendall, Sherrie Wang, James J. Butler, Bruno Basso, David Hyndman, and David B. Lobell. “Assessing causal relationships in agricultural soil and water management from observational satellite data.” *American Geophysical Union Fall Meeting*, 2021 (Invited presentation)
8. Christopher Yeh*, Chenlin Meng*, Sherrie Wang*, Anne Driscoll, Erik Rozi, Patrick Liu, Ji-hyeon Lee, Marshall Burke, David B. Lobell, and Stefano Ermon. “SustainBench: Benchmarks for monitoring the Sustainable Development Goals with machine learning.” *NeurIPS Datasets and Benchmarks Track*, 2021 (Presentation)
9. Erfan Rostami, Sherrie Wang, Stefania Di Tommaso, and David B. Lobell. “Toward global-scale field boundary delineation using deep learning.” *American Geophysical Union Fall Meeting*, 2020 (Poster)
10. Sherrie Wang and David B. Lobell. “Deep learning for label-scarce remote sensing applications.” *American Geophysical Union Fall Meeting*, 2020 (Presentation)
11. Sherrie Wang*, Marc Rußwurm*, Marco Körner, and David B. Lobell. “Meta-learning for few-shot time series classification.” *IGARSS*, 2020 (Presentation)
12. David B. Lobell, Walter T. Dado, Jillian M. Deines, Stefania Di Tommaso, and Sherrie Wang. “Landsat-based reconstruction of corn and soybean yield histories in the United States since 1999.” *IGARSS*, 2020 (Presentation)
13. Marc Rußwurm*, Sherrie Wang*, Marco Körner, and David B. Lobell. “Meta-learning for few-shot land cover classification.” *CVPR EarthVision Workshop*, 2020 (Presentation)
14. Sherrie Wang, Stefania Di Tommaso, Joey Faulkner, Thomas Friedel, Alexander Kennepohl, Rob Strey, and David B. Lobell. “Mapping crop types in India with crowdsourced data and deep learning.” *American Geophysical Union Fall Meeting*, 2019 (Presentation)
15. Jillian M. Deines, Sherrie Wang, and David B. Lobell. “Investigating the yield impacts of conservation tillage in the US Corn Belt using Landsat.” *American Geophysical Union Fall Meeting*, 2019 (Presentation)
16. Neal Jean, Sherrie Wang, Anshul Samar, George Azzari, David Lobell, and Stefano Ermon. “Tile2Vec: Unsupervised representation learning for spatially distributed data.” *AAAI*, 2019 (Presentation)
17. Sherrie Wang, William Chen, George Azzari, and David B. Lobell. “Weakly supervised deep learning for segmentation of cropland in remote sensing imagery.” *American Geophysical Union Fall Meeting*, 2018 (Presentation)
18. Zhenong Jin, George Azzari, Sherrie Wang, and David B. Lobell. “Mapping the yields of major crops in Sub-Saharan African smallholder farming system.” *American Geophysical Union Fall Meeting*, 2018 (Poster)
19. Neal Jean, Sherrie Wang, Anshul Samar, George Azzari, David Lobell, and Stefano Ermon. “Tile2Vec: Unsupervised representation learning for spatially distributed data.” *Women in Machine Learning Workshop*, 2018 (Poster)
20. Sherrie Wang, Sebastian Le Bras, George Azzari, and David B. Lobell. “Toward global crop type mapping using a hybrid machine learning approach and multi-sensor imagery.” *American Geophysical Union Fall Meeting*, 2017 (Poster)
21. Evan Wu, Adam Marblestone, Sherrie Wang, Nick Perkons, Thomas Schaus, Sun Wei, and Peng Yin. “Controllable release of gold nanoparticles from a switchable DNA box.” *10th Annual Conference, Foundations of Nanoscience*, 2013 (Poster)

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| INVITED TALKS | Department of Earth, Environmental and Planetary Sciences (DEEPS) Seminar, Brown University. March 2023 |
| | Global Engagement & Empowerment Forum on Sustainable Development (GEEF), Yonsei University. “Monitoring the SDGs via Remote Sensing and Machine Learning.” February 2023 |
| | Sustainable Development Seminar, School of International & Public Affairs, Columbia University. “Planetary-scale digital agriculture via remote sensing.” October 2022 |
| | AGU Fall Meeting, Session on Solving Training Data Bottlenecks for Artificial Intelligence in Earth Science. “Deep learning for label-scarce remote sensing applications.” December 2020 |
| | TWIMLfest (This Week in Machine Learning) Panel on Machine Learning for Sustainable Agriculture. October 2020 |
| | IEEE GRSS Panel on Deep Learning and Remote Sensing. September 2020 |
| | Workshop on Knowledge-Guided Machine Learning, University of Minnesota. “Meta-learning for remote sensing.” August 2020 |
| | Ayiti Analytics Webinar. “Data science for sustainability.” July 2020 |
| | Expert Workshop on Advancing Application of Machine Learning Tools for NASA Earth Observation Data, Washington, DC. “Satellites, satellites all around, but not enough ground truth labels: Lessons from crop type mapping.” January 2020 |
| | Bay Area Scientific Computing Day, Lawrence Berkeley National Lab. “Mapping crop types in southeast India with crowdsourced data and deep learning.” December 2019 |
| | Women in Data Science Podcast. “Applying machine learning to solve global food security challenges.” September 2019 |
| | Computational Sustainability Network Webinar. “Weakly supervised learning for satellite imagery: Applications in crop mapping.” March 2019 |
| HONORS AND AWARDS | Ciriacy-Wantrup Postdoctoral Fellowship, 2021 |
| | \$30,000 Google Cloud Credit Grant from the Stanford Institute for Human-Centered AI, 2020–2022 |
| | Top 5% of papers, International Geoscience and Remote Sensing Symposium (IGARSS), 2020 |
| | Best Paper Award, CVPR EarthVision Workshop, 2020 |
| | Finalist, NCWIT Aspirations in Computing Award, 2020 |
| | Department Short Course Instructor Award, 2019 |
| | Stanford Graduate Fellowship, 2015 – 2018 |
| | Phi Beta Kappa, 2013 |
| | John Harvard Scholar, 2010 – 2012 |
| | Third Place, International BIOMOD Competition, 2011 |
| TEACHING EXPERIENCE | HHMI Interdisciplinary Undergraduate Research Fellowship, 2011 |
| | Detur Book Prize, 2011 |
| | Stanford University , Stanford, California USA |
| | <i>Instructor, Intermediate Topics in Deep Learning (ICME Workshop)</i> August 2021 Designed and taught a survey course to 150 students. Topics included representation learning, transfer learning, weakly supervised learning, and unsupervised learning. |
| | <i>Instructor, Introduction to Deep Learning (ICME Workshop)</i> August 2020 & 2021 Taught workshop on deep learning to 250 participants from academia and industry. |

Instructor, CME 250: Introduction to Machine Learning

Winter 2019

Taught 4-week short course on machine learning; designed and graded problem sets.

Harvard University, Cambridge, Massachusetts USA

Teaching Assistant, ES 53: Quantitative Physiology

Fall 2012

Held office hours for class of 44 students; graded problem sets and exams.

PROFESSIONAL
SERVICE

Speaker, UC Riverside Data Science Summer Fellowship Program, 2022

Speaker, Women in Data Science (WiDS) UC Riverside Conference, 2022

Vlogger, Women in Data Science (WiDS) High School Outreach, 2020

Mentor, Stanford Women in Math Mentoring, 2016 – 2019

Member, ICME Student Council, 2016 – 2019

Organizer and content creator, Women in Data Science Conference Datathon, 2019

Organizer, Women in Data Science Conference Datathon, 2018

Mentor and judge, Stanford Big Earth Hackathon, April 2018

Math and reading tutor, East Palo Alto Tennis and Tutoring (EPATT), 2016 – 2017

Reviewer: Remote Sensing, IEEE Transactions on Geoscience and Remote Sensing, International Journal of Applied Earth Observation and Geoinformation, NeurIPS Datasets and Benchmarks Track, NeurIPS Spatiotemporal Decision-making Workshop, NeurIPS Machine Learning for Development Workshop, ICML Computer Vision for Global Challenges Workshop, KDD Workshop on Data-driven Humanitarian Mapping

Member: American Geophysical Union, IEEE

OTHER WORK
EXPERIENCE

Atlas AI, Palo Alto, California USA

Visiting researcher

Summer 2018

Developed machine learning models to analyze and predict agricultural and economic indicators at fine resolution across the developing world.

Cardinal Ventures, Stanford, California USA

VP of Mentorship

2015 – 2018

Connected founders to mentors at Stanford's startup accelerator. From 2015 to 2018, graduated 64 companies that raised over \$17 million.

Premise Data, San Francisco, California USA

Data Science Intern

Summer 2016

Used deep learning to analyze millions of observations captured daily by a global network of contributors to unearth connections that impact investment and policy decisions.

Goldman Sachs, New York, New York USA

Investment Banking Analyst

2014 – 2015

Helped corporate clients hedge interest rate and foreign currency risk through the structuring of derivative products in the Corporate Risk Management group.

COMPUTER SKILLS

- Languages: Python; some use of R, C++, Javascript, MATLAB, Unix shell scripts
- Deep Learning Frameworks: PyTorch, TensorFlow, Keras
- Other Frequently-used Software: Jupyter, Google Earth Engine, Google Cloud Platform, Descartes Labs Platform, Adobe Illustrator and Photoshop, L^AT_EX