Shruti Jain

CONTACT INFORMATION

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EDUCATION

University of Oxford **2022 – present**

PhD, Geography and the Environment

- PhD Topic: Resilience and Sustainability of Global Food Systems
- Oxford-Reuben Interdisciplinary Scholar in Environmental Change
- Advisors: Prof. Samuel Fankhauser, Prof. Radhika Khosla

University of California, Berkeley **2016 – 2018**

Master of Public Policy GPA 3.96/4

- Master's Thesis: "A Novel Approach to Measuring Deforestation using Historical Aerial Photographs"
- Advisor: Prof. Solomon Hsiang
- Coursework: Geospatial Analysis, Machine Learning, Econometrics, Microeconomics

Indian Institute of Technology, Roorkee **2008 – 2012**

B.Tech., Electronics & Communication Engineering GPA 8.64/10

PROFESSIONAL EXPERIENCE

The World Bank **July 2023 – present**

Consultant, Living Standards Measurement Study (LSMS)

- Produced $10m$ resolution crop type and yield maps for Mali, Malawi, and Ethiopia, for dissemination via the World Bank Development Data Hub
- Co-led peer-reviewed publications and guidelines on using Earth observation data to supplement surveys for high-resolution mapping of agricultural indicators in data poor environments
- Presented The World Bank LSMS team's research conducted as part of the 50x2030 initiative at academic conferences

Atlas AI, Palo Alto, USA **Jan 2020 – Nov 2023**

Data Science Advisor, Agriculture *Sep 2022 – Nov 2023*
Senior Data Scientist & Agriculture Lead *Jan 2020 – Aug 2022*
Founders: Prof. David Lobell, Prof. Marshall Burke, Prof. Stefano Ermon (Stanford University)

- Led technical execution of service contracts in the agriculture vertical, delivering to clients such as the Ministry of Agriculture in Kenya, the World Bank, and the National Science Foundation
- Managed ML pipelines for remote sensing based landcover and crop type classification, post-harvest yield estimation, in-season forecasting, producing country-wide outputs at $10m$ resolution in Kenya, Malawi, Ethiopia, and Mali
- Co-led a peer-reviewed publication on understanding survey data requirements for satellite-based crop type mapping in Sub-Saharan Africa, as part of the 50x2030 initiative with the World Bank
- Collaborated on cross-functional projects to produce case studies, product documentation, and on QA and validation

Global Policy Lab, University of California, Berkeley, USA **Jan 2018 – May 2019**

Data Scientist
PI: Prof. Solomon Hsiang
Collaborators: Stockholm University, National Collection of Aerial Photography

- Developed and implemented scripts to convert unstructured data comprising 1.6 million satellite images into seamless country level maps, reducing data preparation time by a factor of 10
- Applied and improved computer vision algorithms to predict development indicators using $\sim 20,000$ km^2 of black and white satellite imagery, achieving R-squared values of $\sim 80\%$ of those obtained from colored satellite imagery
- Collaborated with international project partners at UC Berkeley, Stockholm University, and National Collection of Aerial Photography, monitoring project implementation timelines and deliverables across the 3 teams
- Led the effort to obtain the AI for Earth grant of $\$185,000$ awarded by Microsoft and National Geographic

Abdul Latif Jameel Poverty Action Lab (J-PAL), Chennai, India **May – Jul 2017**

Research Associate Intern, Tamil Nadu Rice Fortification Project
PI: Prof. Reynaldo Martorell (Emory University)

- Designed quantitative surveys for an RCT that reached over 400 households, evaluating rice fortification's impact
- Performed exploratory statistical analysis on daily nutritional intake data using multivariate regression models, thus identifying the relationship between nutritional outcomes and socio-economic status
- Administered a pilot survey questionnaire to children in over 30 households, providing a quantitative baseline for cognitive outcomes for children in our target population

Avanti Learning Centres, Mumbai, India **Jun 2015 – May 2016**

Product Manager, Mathematics

- Established and led a 7-member team to develop an innovative mathematics curriculum reaching 2000 students
- Designed 100 classroom hours of curriculum for content delivery across 25 national education centers

Capital One, Bengaluru, India **Jul 2012 – Apr 2013**

Data Analyst

- Handled market segmentation to support the analytical data needs of Enterprise Online Servicing Division
- Investigated digital behavior of $10M+$ customers from web and mobile usage data

Grants and Awards

WB-50x2030 Phase 1 & Phase 2 Awards **2021**

The World Bank, USA $1,308,000

- PI: Dr. Talip Kilic, The World Bank
- Title: Understanding survey requirements for remote sensing based crop area and yield mapping in low and lower-middle income countries
- Involvement: Lead Agriculture Data Scientist, Co-authored Phase 2 grant proposal

NSF-SBIR Phase 1 & Phase 2 Awards **2020**

National Science Foundation, USA $1,225,000

- PI: Dr. George Azzari, Atlas AI
- Title: High resolution in-season forecasting of crop area and yield in Sub-Saharan Africa
- Involvement: Lead Agriculture Data Scientist

AI for Earth Grant **2018**

National Geographic and Microsoft $185,000

- PI: Prof. Solomon Hsiang, UC Berkeley
- Title: Understanding the effect of climate change on human migration in Africa using 1.6 million historical aerial photographs
- Involvement: Co-authored the grant proposal

Departmental Summer Award **2017**

Goldman School of Public Policy, University of California, Berkeley $5,000

Departmental Fellowship Award **2016**

Goldman School of Public Policy, University of California, Berkeley $8,000

Peer-Reviewed Publications

Noda, E., Huang, L.Y., Chong, T., **Jain, S.**, Madestam, A., Tompsett, A., Druckenmiller, H. & Hsiang, S. (2024). A machine-learning pipeline for merging and georeferencing very large archives of historical aerial photographs. *2024 IEEE International Conference on Big Data (BigData)*(pp. 74-83). doi:10.1109/BigData62323.2024.10825635

Azzari, G., **Jain, S.**, Jeffries, G., Kilic, T., & Murray, S. (2021). Understanding the Requirements for Surveys to Support Satellite-Based Crop Type Mapping: Evidence from Sub-Saharan Africa. *Remote Sensing, 13*(23). doi:10.3390/rs13234749

Working Papers

Jain, S., Clark, M. (2025). Quantifying the Environmental Footprint of Packaged Foods at Scale: A Multi-Country Analysis Using Machine Learning and Life Cycle Assessment.

Jain, S. (2024). Mapping Global Cereal Flow at Subnational Scales Unveils Key Insights for Food Systems Resilience. In review.

Jain, S., Kilic, T., Muhamed, A., Murray, S., Sakhrani, V., & Lobell, D. (2023). How Can Large-Scale Surveys Meet Training Data Requirements for Satellite-Based Crop Type Mapping? Cross-Country Evidence from Sub-Saharan Africa.

Jain, S., Kilic, T., Murray, S., Sakhrani, V., Smythe, I., & Campolo, J. (2023). Satellite-Based Crop Yield Mapping in Malawi and Mali using Large-Scale Surveys.

Jain, S. (2018). *A Novel Approach to Measuring Deforestation using Historical Aerial Photographs.* Draft here.

Published Datasets

Azzari, G., **Jain, S.**, Jeffries, G., Kilic, T., & Murray, S. (2021). High-Resolution Crop And Maize Area Mapping For Malawi. *World Bank Development Data Hub.* Available here.

Azzari, G., **Jain, S.**, Jeffries, G., Kilic, T., & Murray, S. (2021). High-Resolution Crop And Maize Area Mapping For Ethiopia. *World Bank Development Data Hub.* Available here.

Teaching Experience

University of Oxford, UK

- *Teaching Assistant*: Sustainable Finance **2024**
- *Teaching Assistant*: Business Strategy for Sustainability **2024**
- *Teaching Assistant*: New Environmental Economic Thinking **2023**
- *Teaching Assistant*: Methods and Data **2023**
- *Workshop Facilitator*: GIS Skills Workshop **2022**

University of California, Berkeley, USA

- *Workshop Facilitator, CEGA Geo4Dev*: Crop type mapping using satellite data **2022**
- *Teaching Assistant, PP210A & PP210B*: Graduate level Microeconomics **2017 – 2018**
- *Teaching Assistant, STAT 20*: Undergraduate level Statistics **2016 – 2017**

Teach For India, New Delhi, India

Fellow/Multi-subject Elementary Teacher **May 2013 – May 2015**

- Taught a class of 30 students (grades IV & V) in a low-income school, achieving average grade level growth of 3.9 years
- Strategized community outreach to engage students' parents, resulting in improved student performance

Conference Proceedings

Jain, S. Mapping Global Cereal Flow at Subnational Scales Unveils Key Insights for Food Systems Resilience. *Royal Geographical Society Annual International Conference*, 2024

Jain, S, Kilic, T, Muhamed, A, Murray, S, Sakhrani, V. How Can Large-Scale Surveys Meet Training Data Requirements for Satellite-Based Crop Type Mapping? Cross-Country Evidence from Sub-Saharan Africa. *International Conference of Agricultural Economists*, 2024

Jain, S. Mapping Global Cereal Flow at Subnational Scales Unveils Key Insights for Food Systems Resilience. *Economics of Sustainability Workshop, University of Oxford*, 2024

Jain, S. Mapping Global Cereal Flow at Subnational Scales Unveils Key Insights for Food Systems Resilience. *Livestock, Environment and People Conference, University of Oxford*, 2024

Jain, S, Kilic, T, Muhamed, A, Murray, S, Sakhrani, V. How Can Large-Scale Surveys Meet Training Data Requirements for Satellite-Based Crop Type Mapping? Cross-Country Evidence from Sub-Saharan Africa. *European Association of Agricultural Economists congress*, 2023

Jain, S, Kilic, T, Muhamed, A, Murray, S, Sakhrani, V. How Can Large-Scale Surveys Meet Training Data Requirements for Satellite-Based Crop Type Mapping? Cross-Country Evidence from Sub-Saharan Africa. *European Survey Research Association conference*, 2023

Invited Talks

Using remote sensing with LSMS surveys to map maize area and yield in Sub-Saharan Africa. The World Bank Development Data Partnership, 2021

How can AI and satellite imagery help provide swift, granular datasets in areas without speedy or up-to-date data collection?. Center for Effective Global Action (CEGA), University of California, Berkeley, 2021

Certifications

- Data Science, The Data Incubator — Nov 2019
- Deep Learning Specialization, deeplearning.ai on Coursera (Credential) — Aug 2019
- Machine Learning, Stanford University on Coursera — May 2019

Technical Skills

- Data Science: Geospatial Analysis, Deep Learning, Causal Inference, Computer Vision, NLP, Data Wrangling
- Software: Python, SQL, R, MATLAB, GEE, QGIS, Git, GCP

Languages

English (Fluent), Hindi (Native/Fluent)

References

Prof Sam Fankhauser
Professor of Climate Economics and Policy
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University of Oxford
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Prof David Lobell
Professor, Earth System Science
Director, Center on Food Security
Stanford University
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Prof Solomon Hsiang
Professor of Global Environmental Policy
Principal Investigator, Global Policy Laboratory
Stanford Doerr School of Sustainability
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Dr Talip Kilic
Senior Program Manager
Living Standards Measurement Study (LSMS)
The World Bank
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