

# Luna Yue Huang

Development Economics | Geospatial Machine Learning

Interested in applying deep learning methods on satellite images to track global poverty and evaluate policies in international development.

## CONTACT

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## EDUCATION

**UC BERKELEY**  
PHD IN DEVELOPMENT ECONOMICS  
GPA: 3.8  
Expected May 2021 | Berkeley, CA  
Advisors: Edward Miguel & Marco Gonzalez-Navarro

**PEKING UNIVERSITY**  
BA IN ECONOMICS & BS IN ENVIRONMENTAL SCIENCES  
May 2016 | Beijing, China

## COURSEWORK

Applied Econometrics II/III  
Applied Machine Learning  
Probability and Statistics  
Development Economics I/II  
Applied Industrial Organization  
Economic Theory (Micro & Macro)

## SKILLS

Python (& PyTorch) • R  
STATA • Matlab • SQL • QGIS  
Bash • LaTeX • Markdown • Git

## REFERENCE

**Edward Miguel**  
Professor of Economics, UC Berkeley  
emiguel@berkeley.edu

**Marco Gonzalez-Navarro**  
Associate Professor of Agricultural and Resource Economics, UC Berkeley  
marcog@berkeley.edu

**Solomon Hsiang**  
Associate Professor of Public Policy, UC Berkeley  
shsiang@berkeley.edu

## SELECTED RESEARCH

**UNDERSTANDING THE EFFECTS OF CLIMATE CHANGE ON MASS MIGRATION USING 1.6 MILLION HISTORICAL AERIAL PHOTOGRAPHS**  
work in progress, joint with Solomon Hsiang, Andreas Madestam, Anna Tompsett, Hannah Druckenmiller, Nicklas Nordfors, and Trinetta Chong

- Constructs the first historical high-resolution population and land use map of 27 developing countries from the 1940s onward, using an archive of 1.6 million historical aerial photographs originally taken to map the former British Empire.
- Uses state-of-the-art machine learning classification and segmentation techniques to identify houses, roads, agricultural lands and forests to study the effects of droughts, hurricanes and other changes in climate on population settlement and economic development patterns over 80 years.

**BEYOND NIGHTLIGHT: USING DAYTIME HIGH-RESOLUTION SATELLITE IMAGES IN ECONOMICS**

work in progress

- Develops a methodology that uses a machine learning model (Mask RCNN) to extract signals on housing quality from satellite images, and constructs high-resolution poverty maps across developing countries where survey or census data are scarce.
- Causally estimates the effects of cash transfers from a US charity (GiveDirectly) and obtains consistent results with extensive in-person surveys.
- Successfully validates the poverty and inequality estimates against traditional economic censuses in Mexico.

## PUBLICATION

- Using randomized controlled trials to estimate long-run impacts in development economics. Joint with Adrien Bouguen (Santa Clara), Michael Kremer (Harvard, 2019 Nobel laureate), and Edward Miguel (UC Berkeley). *Annual Review of Economics*, 11(1): 523-561, 2019.

## TEACHING

**SPATIAL DATA AND ANALYSIS (IN PYTHON)**  
[GSPP 275] Fall 2019 | MPP/MPA/PhD Level, UC Berkeley

**INTERMEDIATE MICROECONOMICS**  
[MBA 201A] Fall 2018 | MBA Level, UC Berkeley

## AWARDS AND GRANTS

2018	East Africa Social Science Translation Collaborative Mentor Grant, Center for Effective Global Action, UC Berkeley
2015	Academic Creativity Award, Peking University
2013-15	Bajian Rencai Scholarship, Peking University
2014	Mao Yugang Foundation Grant for Undergrad Research
2013-14	Wusi Scholarship, Peking University