MINGHAO QIU

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updated: September, 2021

EMPLOYMENT

Postdoctoral Scholar, Department of Earth System Science, Stanford University, October, 2021 - present
Advisor: Marshall Burke

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA September, 2016 - September, 2021
Ph.D., *Social and Engineering Systems*, Institute for Data, Systems, and Society
Thesis committee: Noelle E. Selin (advisor), Valerie J. Karplus, Corwin M. Zigler, Colette L. Heald
Selected PhD courses: Econometrics; Statistical machine learning; Environmental modeling; Atmospheric chemistry; Microeconomics; Probability; Optimization.

Peking university, Beijing, China September 2012 - July 2016
B.S., *Environmental Sciences*. B.A., *Economics*

RESEARCH EXPERIENCE

Massachusetts Institute of Technology, Cambridge, MA September 2016 - September 2021
Graduate Research Assistant
Evaluated the ability of statistical models to correct for meteorological variability when estimating causal impacts of policy on air quality; designed a new machine learning approach that reduced estimation bias by 60% compared to widely-used regression methods.

Estimated the effects of wind power on air quality, health and environmental justice in the US with causal inference, GEOS-Chem and adjoint model; performed cost-benefit analysis of wind power at state level.

Examined the causal effects of China's energy efficiency and SO_2 policies on air quality at firm-level.

International Institute for Applied Systems Analysis, Austria June 2019 - September 2019
Researcher, Young Scientists Summer Program
Developed the first statistical method to estimate average emission factors of diesel vehicles with instantaneous measurements from remote sensing; directly quantified efficiency and uncertainty of remote sensing based high-emitter detection programs.

University of California, Berkeley, Berkeley, CA June 2015 - October 2015
Visiting Student Researcher, Atmospheric Chemistry Group (advised by Prof. Ronald Cohen)

Peking University, Beijing, China January 2015 - July 2016
Research Assistant, College of Urban and Environmental Sciences (advised by Prof. Junfeng Liu)

PUBLICATIONS

Qiu, M., Weng, Y., Cao, J., Selin, N., Karplus,V. (2020). Improving evaluation of energy policies with multiple goals: Comparing *ex ante* and *ex post* approaches *Environmental Science & Technology*, 54(24), 15584-15593. [Link]

Qiu, M., Zigler, C., Selin, N.(2021). Impacts of wind power on air quality, premature mortality and environmental justice in the US. *(under review, PNAS)*

Qiu, M., Borken-Kleefeld, J. (2021). Using snapshot measurements to identify high-emitting vehicles. *(submitted)*

Qiu, M., Zigler, C., Selin, N. (2021). Statistical and machine learning methods for evaluating emissions reduction policies under changing meteorological conditions. *(in preparation)*

Yang, H., Tao, W., Liu, Y., **Qiu, M.**, Liu, J., Jiang, K., Yi, K., Xiao, Y., & Tao, S. (2018). The contribution of the Beijing, Tianjin and Hebei region's iron and steel industry to local air pollution in winter. *Environmental Pollution*. [Link]

Wei, K., **Qiu, M.**, Zhang, R., Zhou, L., Zhang, T., Yao, M., & Luo, C. (2017). Single Living yEast PM Toxicity Sensor (SLEPTor) System. *Journal of Aerosol Science*, 107, 65-73. [Link]

SELECTED PRESENTATIONS

Qiu, M. Assessing impacts of energy and environmental policies on air quality in the real world. *Brandeis University (invited)*, 2021

Qiu, M., Selin, N. Statistical and machine learning methods for evaluating emissions reduction policies under changing meteorological conditions. *American Geophysical Union Fall Meeting*, 2020

Qiu, M., Zigler, C., Selin, N. Effectiveness of renewable energy policy for air pollution reductions: evidence from wind power in the US. *American Meteorological Society Annual Meeting*, Boston, MA, 2020

Qiu, M., Weng, Y., Selin, N., Cao, J., Karplus,V. Air Quality Co-benefits of Energy Policy: Evidence from industrial firms in China. *American Geophysical Union Fall Meeting*, New Orleans, LA, 2017

AWARDS

Outstanding Student Presentation Awards (OSPA), American Geophysical Union Fall Meeting	2021
MIT Martin Family Society of Fellows for Sustainability	2020
Young Scientists Summer Program at IIASA	2019
National Merit Scholarship (highest honor for undergraduate students in China)	2014 - 2015
Distinguished Academic Scholarship (top 1 student in college)	2014 - 2015

PROFESSIONAL EXPERIENCE

World Resource Institute, Beijing, China — January 2016 - July 2016
Research Analyst, China's energy group
Analyzed China's decarbonization strategy under Paris Agreement for energy supply, building, industry and transportation sectors; Drafted research report "China's CO_2 Emissions Pathways and Reduction Strategies under Paris Agreement".

PROFESSIONAL DEVELOPMENT AND SERVICE

MIT 6.419x Data Analysis: Statistical Modeling and Computation in Applications, Course contributor	2021
MIT Social and Engineering Systems Doctoral Seminar, Coordinator	2019 - 2020
MIT Energy for Human Development, Co-President	2017 - 2019
MIT Joint Program on the Science and Policy of Global Change, Lecturer of "Climate Change Policy"	2017

LANGUAGE

Chinese (Mandarin): Native; English: Fluent

SKILLS

Atmospheric modeling: GEOS-Chem, Community Earth System Model (CESM) ‖
Statistical causal inference ‖ **Machine learning** ‖
Coding and software: R, Python, Matlab, STATA, ArcGIS