QIANG PU

(*last update*: *May 2022*)

Department of geography
University at Buffalo, SUNY
Buffalo, New York, USA

E-mail: qiangpu@buffalo.edu
Phone: (716) 580-0604
Website: www.qiangpu.site

RESEARCH INTERESTS

Ambient air pollution exposure modeling (primarily PM2.5), Satellite air quality remote sensing, Spatial temporal data analytics, Environmental health, GIScience.

EDUCATION

08/2017 - 08/2022 (Expected) ***Ph.D.***, in Geography
Department of Geography, University at Buffalo, SUNY, U.S.

Dissertation: Spatial-temporal modeling of ambient PM2.5 concentrations at high resolutions using remote sensing, GIS, and advanced statistical approaches.
Advisor: Dr. Eun-Hye Enki Yoo

09/2014 - 06/2017 ***M.S.***, in Cartography and Geographical Information Engineering
School of Geosciences and Info-Physics, Central South University, China

09/2010 - 06/2014 ***B.S.***, in Geomatics Engineering
School of Geosciences and Info-Physics, Central South University, China

RESEARCH EXPERIENCE

Graduate Student, Department of Geography, University at Buffalo 08/2017 - Present

- Developed a spatio-temporal PM2.5 prediction model which accounts for the presence of missing data in satellite AOD. An additional Bayesian statistical model was used to fill the gaps of AOD-based PM2.5 estimates with quantified uncertainty. Full coverage PM2.5 concentrations were predicted over Beijing metropolitan area (Publication in the *International Journal of Geographical Information Science*).
- Built a missing data imputation model for satellite AOD using multi-source AOD data for the New York State (e.g. satellites, CMAQ, MERRA-2). Examined the uncertainties in downstream PM2.5 predictions either propagated from imputed AOD or due to the choice of PM2.5 prediction models (Publication in the *Environmental Pollution*).
- Proposed a spatio-temporal data fusion approach to synergize the multi-source AOD data from ground monitoring network, polar-orbiting and geostationary satellites, and global reanalysis. Derived AOD at both high spatial and temporal resolutions (1km/hourly) using machine learning and geostatistical methods. AOD-based ground PM2.5 concentrations were predicted over Eastern China provinces and South Korea (Manuscript in revision).

Graduate Research Assistant, University at Buffalo 06/2018 - 08/2018

Funded through *Community for Global Health Equity Seed Funding - "Pediatric Surgery Infrastructure Development in Eastern Democratic Republic of Congo".*

- Developed a systematic approach to evaluate the spatial accessibility and to conduct healthcare planning in resource-poor regions using open-source spatial datasets (Publication in the *Applied Geography*).

PUBLICATIONS

Peer-reviewed journal Articles

Submitted and in preparation

Pu, Q. & Yoo, E. H. A hybrid approach to estimate spatially and temporally resolved $PM_{2.5}$ distributions from multi-sourced AOD data. (under review)
Yoo, E. H, **Pu, Q.** & Palermo, Tia. A two-stage geostatistical linkage of national demographic and health survey data. (in preparation)

Published or in press

2021 **Pu, Q.** & Yoo, E. H. (2021). Ground PM2.5 prediction using imputed MAIAC AOD with uncertainty quantification. *Environmental Pollution*. 274, 116574. DOI: 10.1016/j.envpol.2021.116574

2021 Yoo, E. H., **Pu, Q.**, Eum, Y., & Jiang, X. (2021). The impact of individual mobility on long-term exposure to ambient PM2.5: assessing effect modification by travel patterns and spatial variability of PM2.5. *International Journal of Environmental Research and Public Health*, 18(4), 2194. DOI: 10.3390/ijerph18042194

2020 Cairo, S. B., **Pu, Q.**, Kalisya, L. M., Bake, J. F., Zaidi, R., Poenaru, D., & Rothstein, D. H. (2020). Geospatial mapping of pediatric surgical capacity in North Kivu, Democratic Republic of Congo. *World Journal of Surgery*, 44(11), 3620-3628. DOI: 10.1007/s00268-020-05680-2

2020 **Pu, Q.**, Yoo, E. H., Rothstein, D. H., Cairo, S. B., & Malemo, L. (2020). Improving the spatial accessibility of healthcare in North Kivu, Democratic Republic of Congo. *Applied Geography*, 121, 102262. DOI: 10.1016/j.apgeog.2020.102262

2020 **Pu, Q.** & Yoo, E. H. (2020). Spatio-temporal modeling of PM2.5 concentrations with missing data problem: a case study in Beijing, China. *International Journal of Geographical Information Science*, 34(3), 423-447. DOI: 10.1080/13658816.2019.1664742

2016 Zou, B., **Pu, Q.**, Bilal, M., Weng, Q., Zhai, L., & Nichol, J. E. (2016). Nichol. High-resolution satellite mapping of fine particulates based on geographically weighted regression. *IEEE Geoscience and Remote Sensing Letters*, 4(13): 495-499. DOI: 10.1109/LGRS.2016.2520480

2014 Dong, M., Zou, B., **Pu, Q.**, Wan, N., Yang, L., & Luo, Y. (2014). Spatial pattern evolution and casual analysis of county level economy in Changsha-Zhuzhou-Xiangtan urban agglomeration, China. *Chinese Geographical Science*, 24(5): 620-630. DOI: 10.1007/s11769-014-0685-2

CONFERENCE PRESENTATIONS

Oral Presentations

2022 Yoo, E. H., Roberts, J., **Pu, Q.** & Palermo, T. Geospatial modeling of national health survey delivery data: A case study of Tanzania. *International Conference on Geostatistics for Environmental Applications*, Parma, Italy, June 22-24, 2022.

2022 **Pu, Q.** & Yoo, E. H., A hybrid Approach to estimate spatially and temporally resolved PM2.5 distributions from multi-satellite AOD data. *AAG Annual Conference, John Odland student paper competition through the Spatial Analysis and Modeling specialty group*, New York City, U.S., Feb 25 - Mar 1, 2022. (**Finalist, top 10 out of 25**)

2020 **Pu, Q.** & Yoo, E. H., Modeling spatial variation of hourly PM2.5 concentrations using both CMAQ model and satellite aerosol optimal depth. *Exposome Symposium: Measuring the Exposome Using Novel Methods and Big Data to Improve Human Health*, New York City, U.S., Mar 5-6, 2020

2019 **Pu, Q.** & Yoo, E. H., Spatio-temporal modeling of PM2.5 concentrations with missing data problem. *2019 AAG Annual Conference*, *Symposium on Frontiers in Geospatial Data Science*, Washington DC, U.S., Apr 3-7, 2019.

2019 Niu, Z., Mu, L., Wen, X., & **Pu, Q**. Leukocyte telomere length and cardiovascular disease mortality among US adults: effect modification by race. *Annals of Epidemiology*, 40, 38.

2018 **Pu, Q.** & Yoo, E. H., Perdition of Urban $PM_{2.5}$ Concentrations Using a Bayesian Spatio-temporal Modelling Approach. *The 13th International Symposium of Spatial Accuracy: Spatial Accuracy Assessment in Natural Resources and Environmental Sciences*, Beijing, China, May 21-24, 2018.

2015 **Pu, Q.**, & Zou, B., High–resolution satellite mapping of fine particulates based on geographically weighted regression. *International Workshop on Mobility and Land Cover Change Mapping*, Changsha, China, 2015.

Poster Presentations

2022 Eum, Y., **Pu, Q.** & Yoo, E. H. Spatio-temporal exposure assessment of urban cyclists: Using bike-sharing data and highly-resolved PM2.5 estimates. *UCGIS Symposium 2022 GIScience Forward: Meeting the Challenge*, Syracuse, U.S., June 7-9, 2022.

TEACHING EXPERIENCE

Department of Geography, University at Buffalo, SUNY

Lab Instructor (Cross-level listed Evaluation: 4.2/5.0)	GEO 481/506: Geographical Information System (3 times) GEO 479/559: GIS for Environmental Modeling (4 times) GEO 483/553: Remote Sensing (2 times)	**Fall 2017** To **Spring 2022**
Grader (Undergraduate)	GEO 102 Human Geography; GEO 106 Global Climate Change GEO 120: Maps: Earth from Above; GEO 106: Global Climate Change	

Guest Lecturer	GEO 481/506, Geographic Information Systems. Invited to teach one 50-minute lecture on introduction to satellite remote sensing and its application for air pollution monitoring.	**Spring 2020**
	GEO 482/507, Locational Analysis. Invited to teach one 50-minute lecture about the network analysis using GIS.	**Fall 2019**

AWARDS AND HONORS

2021	**Travel Award**, Department of Geography, University at Buffalo, SUNY
2019	**Professional Development Award**, Graduate Student Employees Union **Travel Award**, National Center for Geographic Information and Analysis at Buffalo
2018	**First Place Student Paper Presentation Award**, the 13th International Symposium of Spatial Accuracy **Travel Award**, Department of Geography, University at Buffalo, SUNY
2015	**National Scholarship for Graduates**, Ministry of Education of China
2014	**National Scholarship for Graduates**, Ministry of Education of China **The Baogang Excellence Scholarship**, Baosteel Group Corporation **First-Class Outstanding Student Scholarship**, Central South University
2013	**National Encouragement Scholarship**, Ministry of Education of China **Second-Class Outstanding Student Scholarship**, Central South University

AD-HOC JOURNAL REVIEWER

African Geographical Review
Geocarto International
Journal of Environmental Management
Scientific Reports

SKILLS

Statistical Programming Languages: R, Python
Machine Learning: H2O, Scikit-learn, TensorFlow
Software Packages: ArcGIS suite, ENVI, Google Earth Engine, LaTeX, QGIS, SAS, SPSS

MEDIA

Global Health Equity Research in Translation Series (policy brief)	Issue 12: Towards a Cartography of Equity: Leveraging Geographic Information Systems and Data Science to Improve Access to Healthcare in North Kivu, DRC, and other LMICs.