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Fei Yao

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Professional Experience

- **Apr 2023 – Present (Open-ended)** Research Scientist, National Centre for Earth Observation, University of Edinburgh
- **Mar 2022 – Mar 2023** Postdoctoral Research Associate, School of GeoSciences, University of Edinburgh
- **Oct 2021 – Feb 2022** Research Consultant, Edinburgh Innovations Limited, University of Edinburgh

Education

- **Sep 2018 – Mar 2022** PhD in Atmospheric and Environmental Sciences, University of Edinburgh
- **Aug 2015 – Jul 2018** MSc in Geography: Urban and Regional Planning, Peking University
- **Sep 2011 – Jul 2015** BSc in Geographical Information System, East China Normal University

Peer-reviewed articles (*: Corresponding author; #: Co-first author)

18. **Yao, F.***, Palmer, P.I., Liu, J., Chen, H. and Wang, Y., 2024. Attribution of Solar Energy Generation Losses due to Transboundary Particulate Matter Pollution Associated with Trade Across Northeast Asia. *In preparation*.
17. Liu, J.$^{\#}$, **Yao, F.**$^{\#}$, Chen, H.* and Zhao, H.*, 2024. Quantifying the mutual contributions of $PM_{2.5}$ pollution and associated population exposure and premature deaths among China, South Korea, and Japan: A dual perspective and an interdisciplinary approach. *Submitted*.
16. Wang, Y., Wang, H., **Yao, F.***, Stouffs, R. and Wu, J.*, 2024. An Integrated Framework for Jointly Assessing Spatiotemporal Dynamics of Surface Urban Heat Island Intensity and Footprint: China, 2003-2020. *Sustainable Cities and Society*, 112, p.105601. doi: 10.1016/j.scs.2024.105601.
15. Marvin, M.R.*, Palmer, P.I., **Yao, F.**, Latif, M.T. and Kahn, M.F., 2024. Uncertainties from biomass burning aerosols in air quality models obscure public health impacts in Southeast Asia. *Atmospheric Chemistry and Physics*, 24(6), pp.3699–3715. doi: 10.5194/acp-24-3699-2024.
14. **Yao, F.*** and Palmer, P.I., 2022. Source sector mitigation of solar energy generation losses attributable to particulate matter pollution. *Environmental Science & Technology*, 56(12), pp.8619–8628. doi: 10.1021/acs.est.2c01175.
13. Liu, J.*, Li, J. and **Yao, F.**, 2022. Source-Receptor Relationship of Transboundary Particulate Matter Pollution between China, South Korea, and Japan: Approaches, Current Understanding, and Limitations. *Critical Reviews in Environmental Science and Technology*, 52(21), pp.3896-3920. doi: 10.1080/10643389.2021.1964308.
12. Mogno, C.*, Palmer, P.I., Knote, C., **Yao, F.** and Wallington, T.J., 2021. Seasonal distribution and drivers of surface fine particulate matter and organic aerosol over the Indo-Gangetic Plain. *Atmospheric Chemistry and Physics*, 21(14), pp.1-39. doi: 10.5194/acp-21-10881-2021.
11. Wu, J.*, Wang, Y., Liang, J. and **Yao, F.**, 2021. Exploring common factors influencing $PM_{2.5}$ and O_3 concentrations in the Pearl River Delta: Tradeoffs and synergies. *Environmental Pollution*, 285, p.117138. doi: 10.1016/j.envpol.2021.117138.
10. **Yao, F.*** and Palmer, P.I., 2021. A model framework to reduce bias in ground-level $PM_{2.5}$ concentrations inferred from satellite-retrieved AOD. *Atmospheric Environment*, 248, p.118217. doi: 10.1016/j.atmosenv.2021.118217.
9. Guo, H., Zhan, Q., Ho, H.C., **Yao, F.**, Zhou, X., Wu, J. and Li, W.*, 2020. Coupling mobile phone data with machine learning: How misclassification errors in ambient $PM_{2.5}$ exposure estimates are produced?. *Science of The Total Environment*, 745, p.141034. doi: 10.1016/j.scitotenv.2020.141034.
8. Guo, H., Li, W.*, **Yao, F.**, Wu, J., Zhou, X., Yue, Y. and Yeh, A.G., 2020. Who are more exposed to $PM_{2.5}$ pollution: A mobile phone data approach. *Environment international*, 143, p.105821. doi: 10.1016/j.envint.2020.105821.
7. Wu, J., Liang, J., Zhou, L., **Yao, F.** and Peng, J.*, 2019. Impacts of AOD Correction and Spatial Scale on the Correlation between High-Resolution AOD from Gaofen-1 Satellite and In Situ $PM_{2.5}$ Measurements in Shenzhen City, China. *Remote Sensing*, 11(19), p.2223. doi: 10.3390/rs11192223.
6. **Yao, F.**, Wu, J.*, Li, W.* and Peng, J., 2019. A spatially structured adaptive two-stage model for retrieving ground-level $PM_{2.5}$ concentrations from VIIRS AOD in China. *ISPRS Journal of Photogrammetry and Remote Sensing*, 151, pp.263-276. doi: 10.1016/j.isprsjprs.2019.03.011.
5. **Yao, F.**, Wu, J.*, Li, W. and Peng, J., 2019. Estimating daily $PM_{2.5}$ concentrations in Beijing using 750-M VIIRS IP AOD retrievals and a nested spatiotemporal statistical model. *Remote Sensing*, 11(7), p.841. doi: 10.3390/rs11070841.
4. **Yao, F.**, Si, M., Li, W.* and Wu, J.*, 2018. A multidimensional comparison between MODIS and VIIRS AOD in estimating ground-level $PM_{2.5}$ concentrations over a heavily polluted region in China. *Science of the Total Environment*, 618, pp.819-828. doi: 10.1016/j.scitotenv.2017.08.209.
3. Wang, Z., **Yao, F.**, Li, W. and Wu, J.*, 2017. Saturation correction for nighttime lights data based on the relative NDVI. *Remote Sensing*, 9(7), p.759. doi: 10.3390/rs9070759.

2. Wu, J., **Yao, F.**, Li, W.* and Si, M., 2016. VIIRS-based remote sensing estimation of ground-level $PM_{2.5}$ concentrations in Beijing–Tianjin–Hebei: A spatiotemporal statistical model. *Remote Sensing of Environment*, 184, pp.316-328. doi: 10.1016/j.rse.2016.07.015.
1. **Yao, F.**, Ye, K. and Zhou, J.*, 2015. Automatic image classification and retrieval by analyzing plant leaf features. *Journal of Zhejiang A&F University*, 32(3), pp.426-433. doi: 10.11833/j.issn.2095-0756.2015.03.015.

Conference presentations (Selected)

4. ESA ATMOS 2024, Bologna, Italy, 1-5 July, 2024. Presentation title: Inferring NOx emissions from GEMS data.
3. The EGU General Assembly 2024, Vienna, Austria, 14-19 April, 2024. Presentation title: Impacts of Air Pollutant Emissions on Solar Energy Generation.
2. The 1st (virtual) GEOS-Chem Europe Meeting, 1-2 September, 2020. Poster title: A model framework to reduce bias in ground-level $PM_{2.5}$ concentrations from satellite-retrieved AOD.
1. The 10th International Association for China Planning Conference, Beijing, China, 30 June - 3 July, 2016. Presentation title: Remote sensing estimation of ground-level $PM_{2.5}$ concentrations in Beijing-Tianjin-Hebei: A spatiotemporal statistical model.

Research Grants (Selected)

4. **Yao, F.**, Jan 2023 – Jul 2024. Establishing a satellite-based detecting and early-warning system for worldwide methane leaks. IT Small Grants (£990.6) and Global Change Small Grants (£994.56) of School of GeoSciences at the University of Edinburgh.
3. **Yao, F.**, Oct 2022 – Jan 2024. Harnessing satellite observations of methane to inform climate change mitigation strategies. Google Cloud Research Credits Program (£4,685.00) and Earth Engine Uplift Program (an Uplift for quota up to 500 QPS and 100 Concurrent Queries, which is valued at $1.33 per EECU-hour).
2. **Yao, F.**, Jan 2021 – Jul 2021. Improving solar energy generation by reducing anthropogenic source sector emissions. IT Small Grants of School of GeoSciences at the University of Edinburgh, £650.
1. **Yao, F.**, Si, M., Wang, W. and Shen, N., Jan 2017 – Jun 2017. Estimating ground-level $PM_{2.5}$ concentrations in Beijing-Tianjin-Hebei based on multi-source remote sensing data. Presidential Research Fund of Peking University Shenzhen Graduate School (No. 201607), CNY ¥12,000.

Honors & Awards (Selected)

4. National Scholarship, awarded by Ministry of Education of the People's Republic of China, 2013, 2016, and 2017.
3. Excellent Graduate, awarded by Peking University, Jun 2018.
2. Exceptional Award for Academic Innovation, awarded by Peking University, Dec 2016 and 2017.
1. Excellent Graduate, awarded by Shanghai Municipal Education Commission, May 2015.

Services & Activities

- Tutor & Demonstrator for *Earth's Atmospheric Composition* (Spring 2020, 2021), *Visual Analytics* (Spring 2019), *Welcome Week Computing Induction* (Autumn 2019).
- Reviewer for Academic Journals: *Environmental Science & Technology*, *Remote Sensing of Environment*, *ISPRS Journal of Photogrammetry and Remote Sensing*, *Atmospheric Environment*, *Journal of the Royal Statistical Society: Series C*, and *Journal of Cleaner Production*, among others.

Skills

- **Platform**: Proficient in *Laptop, Desktop, Workstation, High Performance Computing, and Cloud Computing including Amazon Web Service, Google Cloud, and Google Earth Engine*.
- **Programming**: Proficient in *Python, FORTRAN, Shell, LaTex*, Intermediate in *Stata, MATLAB, R, and C*, and Basic in *IDL, Perl, C#, JavaScript, VB, Julia, etc*.
- **Software**: Proficient in *ArcGIS Desktop, ENVI, and Microsoft Office*, Intermediate in *CorelDRAW and Adobe Photoshop*.
- **Models**: Proficient in *3-D model of atmospheric composition (e.g. GEOS-Chem), machine and deep learning (e.g. scikit-learn and TensorFlow), and solar photovoltaic performance modelling (e.g. PVLIB-Python)*, Intermediate in *spatiotemporal statistical models (e.g. panel data regression models and (multi-scale) geographically (temporally) weighted regression models)*, and Basic in *Cellular automation and Agent-based models*.
- **Data**: Proficient in *Big data processing and analysis particularly space-borne Earth observations (e.g. MODIS onboard Terra and Aqua, VIIRS onboard Suomi-NPP, MSI onboard Sentinel-2, GEMS onboard GK-2B, etc.)*
- **Language**: Mother Tongue of Chinese, and Proficient in English (IELTS: 7).