
PROFESSIONAL EXPERIENCE

- **Oct 2021 – Feb 2022** Research Consultant on the Locust Project, Edinburgh Innovations, The University of Edinburgh
 - My responsibility is to use machine learning to identify coherent patterns in satellite data associated with locusts in their solitary and the start of their gregarious phases before they prepare to swarm.

EDUCATION

- **Sep 2018 – Sep 2021** PhD in Atmospheric and Environmental Sciences (Supervisor: [Prof. Paul Palmer](#)), School of Geo-Sciences, The University of Edinburgh. Key research chapters of my thesis "Understanding particulate matter pollution and photovoltaic power output using data and models" are peer-reviewed and published (14 & 10).
- **Aug 2015 – Jul 2018** MSc in Geography: Urban and Regional Planning (Supervisor: [Prof. Jiansheng Wu](#)), School of Urban Planning and Design, Peking University. Key research chapters of my thesis "Satellite remote sensing retrievals of ground-level PM_{2.5} concentrations in China based on VIIRS data" are peer-reviewed and published (6 & 5).
- **Sep 2011 – Jul 2015** BSc in Geographical Information System (Supervisor: Prof. Xuepei Han), School of Geography, East China Normal University. Key research chapters of my thesis "VIIRS-based remote sensing estimation of ground-level PM_{2.5} concentrations in Beijing-Tianjin-Hebei" are peer-reviewed and published (2).

PEER-REVIEWED ARTICLES (*: CORRESPONDING AUTHOR; #: CO-FIRST AUTHOR)

14. **Yao, F. *** and Palmer, P.I., 2021. Deep cuts in residential emissions substantially benefit Asian photovoltaic power output. In revision for *Environmental Science & Technology*.
13. Liu, J. *, Li, J. and **Yao, F.**, 2021. 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*. doi: [10.1080/10643389.2021.1964308](https://doi.org/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](https://doi.org/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 O₃ concentrations in the Pearl River Delta: Tradeoffs and synergies. *Environmental Pollution*, 285, p.117138. doi: [10.1016/j.envpol.2021.117138](https://doi.org/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](https://doi.org/10.1016/j.atmosenv.2021.118217). [Slides](#).
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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1016/j.scitotenv.2017.08.209). [Slides](#).
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](https://doi.org/10.3390/rs9070759). [Slides](#).
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](https://doi.org/10.1016/j.rse.2016.07.015). [Slides](#).
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](https://doi.org/10.11833/j.issn.2095-0756.2015.03.015).

CONFERENCE PRESENTATIONS (SELECTED)

5. 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. [Slides](#).
4. The 9th International GEOS-Chem Meeting, Cambridge, US, 6-9 May, 2019. Poster title: PM_{2.5} over China inferred from MAIAC AOD and GEOS-Chem: preliminary results.
3. Regular Palmer Group Meeting, Edinburgh, UK, 15 February, 2019. Presentation title: AWS Cloud for Atmospheric Scientists. [Slides](#).
2. The 3rd regular meeting of the NCEO ATM-BIO group, RAL/Oxfordshire, UK, 1-2 November, 2018. Presentation title: PM_{2.5} over China during 2000-2018 inferred from MAIAC AOD: my PhD project description.
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. [Slides](#). [Best Student Paper Award](#).

RESEARCH GRANTS (SELECTED)

4. **Yao, F.**, Jan 2021 – Jul 2021. Improving solar power generation by reducing anthropogenic source sector emissions. IT Small Grants of School of GeoSciences at the University of Edinburgh, £650.
3. **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.
2. **Yao, F.**, Si, M., Cao, Q., Wang, W., Shen, N., Yuan, T. and Xu, L., Jan 2016 – Jun 2016. Estimation of ground-level PM_{2.5} concentrations and corresponding health effects in Beijing-Tianjin-Hebei based on a spatiotemporal statistical model. Presidential Research Fund of Peking University Shenzhen Graduate School (No. 2015017), CNY ¥10,000.
1. **Yao, F.**, Yan, Y. and Cai, Z., Oct 2014 – Jun 2015. Automatic image classification and retrieval by analyzing plant leaf features. National Training Program of Innovation and Entrepreneurship for Undergraduates (No. 201410269099), CNY ¥8,000.

HONORS & AWARDS (SELECTED)

5. China Scholarships Council (CSC)/University of Edinburgh Scholarships, awarded by CSC, Jun 2018.
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: *Remote Sensing Applications: Society and Environment* (2021-), *Journal of the Royal Statistical Society: Series C* (2021-), *Atmospheric Environment* (2020-), *Open Geosciences* (2020-), *ISPRS Journal of Photogrammetry and Remote Sensing* (2019-), *Aerosol and Air Quality Research* (2018-), *Environmental Science & Technology* (2017-), *Remote Sensing of Environment* (2017-).

SKILLS

- **Platform:** Proficient in *PC, Workstation, and Server*, and Intermediate in *Cloud Computing* (e.g. *Amazon Web Service, Google Earth Engine*) and *High Performance Computing*.
- **Programming:** Proficient in *Python and Shell*, Intermediate in *FORTRAN, Latex, Stata, MATLAB, R, and C*, and Basic in *IDL, Perl, C#, JavaScript, VB, Julia, etc.*
- **Models:** Proficient in *3-D model of atmospheric chemistry and transport* (e.g. *GEOS-Chem*), *machine learning* (e.g. *scikit-learn*), 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*.
- **Software:** Proficient in *ArcGIS Desktop, ENVI, and Microsoft Office*, Intermediate in *CorelDRAW and Adobe Photoshop*.
- **Language:** Mother Tongue of Chinese, and Proficient in English (IELTS: 7).