Shirui Hao

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PROFILE

- Looking for a full-time earth observation scientist position.
- Rich experience in spatio-temporal data analysis, handling satellite data (Landsat, MODIS, Sentinel-2, and PlanetScope), agricultural modelling, and data analytics.
- Technical skills: Python, R, Matlab, IDL, Linux/Unix command line and bash scripting, Google Earth Engine (GEE with JavaScript), ENVI, ArcGIS, and QGIS.
- I currently have full working right in Australia.

EDUCATION

Sep 2018 – Feb 2023 **Ph.D.** Data assimilation, remote sensing, agricultural modelling
The University of Melbourne, Melbourne, Australia
- Thesis: Integrating remotely sensed information into crop model to improve model simulation capability.
- Supervisors: A/Prof. Dongryeol Ryu, Prof. Andrew Western, Dr. Eileen Perry
- External Advisors: Dr. Heye Bogena, Prof. Harrie-Jan Hendricks-Franssen

Sep 2015 – June 2018 **M.S.** Quantitative remote sensing
Beijing Normal University, Beijing, China
- Thesis: Assessment of MODIS-based fractional snow cover products over the Tibetan Plateau and exploration of scale effect
- Supervisor: Prof. Lingmei Jiang

Sep 2011 – Jun 2015 **B.S.** Geographical information science and cartography
East China Normal University, Shanghai, China
- Emphasis on studying and practicing skills of geography, geographic information sciences, remote sensing, and programming.

AWARDS

2022	Best Paper Award (special mention) (Departmental postgraduate conference – IEPC2021)	The University of Melbourne, Melbourne, Australia
2021	Best Student Presentation Commendation (The 24th International Congress on Modelling and Simulation – MODSIM2021)	Modelling and Simulation Society of Australia and New Zealand Inc. (MSSANZ)
2021	W. E. and C. H. H. Cook Memorial Award	The University of Melbourne, Melbourne, Australia
2018	Melbourne Research Scholarship	The University of Melbourne, Melbourne, Australia
2015 – 2017	Outstanding Graduate Student Scholarship	Beijing Normal University, Beijing, China
2012, 2014	Outstanding Undergraduate Student Scholarship	East China Normal University, Shanghai, China

PUBLICATIONS

- **Hao, S**., Ryu, D., Western, A., Perry, E., Bogena, H., & Franssen, H. J. H. (2021). Performance of a wheat yield prediction model and factors influencing the performance: A review and meta-analysis. *Agricultural Systems*, 194, 103278. https://doi.org/10.1016/j.agsy.2021.103278
- **Hao, S.**, Jiang, L., Shi, J., Wang, G., & Liu, X. (2018). Assessment of MODIS-based fractional snow cover products over the Tibetan Plateau. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 12(2), 533-548. http://doi.org/10.1109/JSTARS.2018.2879666
- **Hao, S.**, Ryu, D., Western, A., Perry, E., Bogena, H., & Franssen, H. J. H. (**Journal revision**, 2022) Sensitivity of APSIM-Wheat yield predictions to model parameters and inputs. *Agricultural Systems.*
- **Hao, S.**, Ryu, D., Western, A., Perry, E., Bogena, H., & Franssen, H. J. H. (**Internal review**, 2022) Assimilating remotely sensed vegetation observations for wheat yield estimates: a real case study.
- Liu, X., Jiang, L., Wu, S., **Hao, S.**, Wang, G., & Yang, J. (2018). Assessment of methods for passive microwave snow cover mapping using FY-3C/MWRI data in China. Remote Sensing, 10(4), 524.
- Liu, X., Jiang, L., Wang, G., **Hao, S.**, & Chen, Z. (2018). Using a linear unmixing method to improve passive microwave snow depth retrievals. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 11(11), 4414-4429.
- Wang, G., Jiang, L., Wu, S., Shi, J., **Hao, S.**, & Liu, X. (2017). Fractional snow cover mapping from FY-2 VISSR imagery of China. Remote Sensing, 9(10), 983.

CONFERENCES

- **Hao, S**., Ryu, D., Western, A., Perry, E., Bogena, H., & Franssen, H. J. H. (2021). Sensitivity analysis of APSIM wheat yield predictions. *2021 AGU Fall Meeting* **(Oral presentation)**.
- **Hao, S**., Ryu, D., Western, A., Perry, E., Bogena, H., & Franssen, H. J. H. (2021). Performance of the APSIM Classic-Wheat yield prediction: a review and meta-analysis. *24th International Congress on Modelling and Simulation (MODSIM2021)* **(Oral presentation)**.
- **Hao, S**., Ryu, D., Western, A., Perry, E., Bogena, H., & Franssen, H. J. H. (2021). Remotely sensed crop biomass model over wheat cropping field for assimilating Sentinel-2 imagery into a crop yield prediction model. *24th International Congress on Modelling and Simulation (MODSIM2021)* **(Oral presentation)**.
- **Hao, S.**, Jiang, L., Wang, G., Liu, X. (2017). The Effect of Scale and Snow Fragmentation on the Accuracy of Fractional Snow Cover Data over the Tibetan Plateau. *Geoscience and Remote Sensing Symposium (IGARSS), 2017 IEEE International.* IEEE, 2017 **(Oral Presentation)**.
- Wang, G., Jiang, L., **Hao, S.**, Liu, X., Cui, H. (2017). Improving Snow and Cloud Discrimination in MODIS Snow Cover Products. *Geoscience and Remote Sensing Symposium (IGARSS), 2017 IEEE International.* IEEE, 2017 **(Oral Presentation)**.
- Liu, X., Jiang, L., **Hao, S.**, Wang, G., Yang, J. and Chen, Z. (2018). Assessment of Passive Microwave Snow Cover Mapping Methods from FY-3C/MWRI Data in China. *Geoscience and Remote Sensing Symposium (IGARSS)*, *2018 IEEE International.* IEEE, 2018.

SKILLS

Data analysis:	Remote sensing (Landsat, MODIS, Sentinel-2, and PlanetScope); Statistical inference (Data assimilation); Sensitivity analysis (Sobol' method).
Technical skills:	Expert in Python (mostly used packages: NumPy, pandas, SciPy, GDAL, Fiona, Rasterio, Matplotlib, seaborn), R, Matlab, IDL, Linux/Unix command line and bash scripting (for parallel processing of Python and R scripts on HPC), Google Earth Engine (with JavaScript) (for data acquiring, cloud layer masking, indices calculation, layer stacking, imagery cropping, and exporting), ENVI, ArcGIS, and QGIS; Experienced in C#.
Modelling:	Statistical modelling, agricultural modelling, APSIM-Wheat model.

TEACHING EXPERIENCE

2019 - 2022	**Tutor** for subject "Remote Sensing" (GEOM90005) Responsible for preparing and delivering tutorials, teaching Google Earth Engine and ENVI, guiding students for their projects.	**The University of Melbourne**, Melbourne, Australia
2021	**Advisor** for Master students' project: "The application of remote sensing and Cosmic-ray sensing in agriculture" Responsible for providing technical supports and guidance on data analysis and modelling.	**The University of Melbourne**, Melbourne, Australia