



# Andong Hu

*Curriculum Vitae*

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*Birthday* 1990.11.27  
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## WORK

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### Postdoc

*2021 - present*

Cooperative Institute for Research in Environmental Sciences (CIRES), Boulder, USA  
University of Colorado, Boulder, USA

### Postdoc

*2019 - 2021*

Multiscale Dynamic Group, Centrum Wiskunde & Informatica (CWI), Amsterdam, Netherlands

### Research Assistant

*2018 - 2019*

SPACE Research Centre · Geospatial Science, Royal Melbourne Institute of Technology (RMIT).

## EDUCATION

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### Ph.D

2015 - 2020

*SPACE Research Centre · Geospatial Science, Royal Melbourne Institute of Technology (RMIT).*

Supervisor: Prof. Kefei Zhang (RMIT) · Dr. Brett Carter (RMIT)

### BEng.

2009 - 2013

*Nanjing University of Information Science and Technology (NUIST), School of Remote Sensing and Geomatics Engineering, Surveying*

## SKILLS

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- Extensive experience in using the following computing languages such as :
  - Fortran (7 years)
  - Matlab (9 years)
  - Android (9 years)

- Python (5 years)
- L<sup>A</sup>T<sub>E</sub>X(6 years)
- Advanced knowledge of and many years experience in using the following algorithms :
  - Machine Learning (including neural networks, SVM and Gaussian processes)
  - Reinforcement Learning
  - Kalman Filter (including KF,EKF, UKF, EnKF)
  - Particle Filter
  - Spherical Harmonics
  - ...

## **PUBLICATIONS**

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- **Published Paper**

1. **A, Hu.**, M. Sisti., F.Fineli, F.Califano., J.Dargent., M.Faganello., E. Camporeale., J.Teunissen (2020). Identifying Magnetic Reconnection in 2D Hybrid Vlasov Maxwell Simulations with Convolutional Neural Networks. The Astrophysical Journal, 900(1), 86 (**IF=5.7, Q1**).
2. **Hu, A.**, Carter, B., Currie, J., Norman, R., Wu, S., Zhang, K. (2020). A Deep Neural Network Model of Global Topside Electron Temperature Using Incoherent Scatter Radars and Its Application to GNSS Radio Occultation. Journal of Geophysical Research: Space Physics, 125, e2019JA027263. <https://doi.org/10.1029/2019JA027263> (**IF=2.82, Q1**).
3. **Hu, A.**, Carter, B. A., Currie, J. L., Norman, R., Wu, S., Wang, X., Zhang, K. ( 2019). Modeling of topside ionospheric vertical scale height based on ionospheric radio occultation measurements. Journal of Geophysical Research: Space Physics, 124, 4926 4942 <https://doi.org/10.1029/2018JA026280>, (**IF=2.82, Q1**).
4. **Hu, A.**, Zhang, K. (2018). Using Bidirectional Long Short-Term Memory Method for the Height of F2 Peak Forecasting from Ionosonde Measurements in the Australian Region. Remote Sensing, 10(10), 1658. (**IF=4.506, Q1**)
5. **Hu, A.**, Li, Z., Carter, B., Wu, S., Wang, X., Norman, R., Zhang, K. (2018). Helmert-VCE-aided fast-WTLS approach for global ionospheric VTEC modelling using data from GNSS, satellite altimetry and radio occultation. Journal of Geodesy, 1-12. (**IF=4.633, Q1**).
6. **Hu, A.**, Wu, S., Wang, X., Wang, Y., Norman, R., He, C., ... Zhang, K. (2018). Improvement of Reflection Detection Success Rate of GNSS RO Measurements Using Artificial Neural Network. IEEE Transactions on Geoscience and Remote Sensing, 56(2), 760-769 (**IF=4.662, Q1**).
7. **Hu Andong.**, WANG Jian, WANG Yunjia, LIU Chunyan, TAN Xinglong, LI Zengke . An Fusion Positioning for PDR and WiFi Based on Fading Adaptive Weighted EKF. Geomatics and Information Science of Wuhan University , 2016, 41(11): 1556-1562.
8. Wang, J., **Hu, A.**, Li, X., Wang, Y. (2015). An Improved PDR/Magnetometer/Floor Map Integration Algorithm for Ubiquitous Positioning Using the Adaptive Unscented Kalman Filter. ISPRS International Journal of Geo-Information, 4(4), 2638-2659 (**IF=1.723, Q2**).

9. Wang, J., **Hu, A.**, Liu, C., Li, X. (2015). A Floor-Map-Aided WiFi/Pseudo-Odometry Integration Algorithm for an Indoor Positioning System. *Sensors*, 15(4), 7096-7124 (**IF=2.457, Q2**).
10. He, C., Yang, Y., Carter, B., Zhang, K., **Hu, A.**, Li, W., ... & Wu, S. (2020). Impact of thermospheric mass density on the orbit prediction of LEO satellites. *Space Weather*, 18(1), e2019SW002336. (**IF=3.6, Q1**).
11. Li, W., Yue, J., Yang, Y., He, C., **Hu, A.**, Zhang, K. (2018). Ionospheric and Thermospheric Responses to the Recent Strong Solar Flares on 6 September 2017. *Journal of Geophysical Research: Space Physics*, 123(10), 8865-8883 (**IF=2.752, Q1**).
12. He, C., Wu, S., Wang, X., **Hu, A.**, Wang, Q., Zhang, K. (2017). A new voxel-based model for the determination of atmospheric weighted mean temperature in GPS atmospheric sounding. *Atmospheric Measurement Techniques*, 10(6) (**IF=3.248, Q1**).

• **Conference papers (oral presentations or posters as first author)**

1. **Andong Hu**, Yan Wang, Suqin Wu, Kefei Zhang, Robert Norman and Timothy Kodikara (2016) "Using artificial neural network to improve the success rate of the detection of radio occultation reflection", Poster presentation at 2016 IROWG-5, Graz, Austria.
2. **Andong Hu**, Brett Carter, Suqin Wu, Julie Currie, Kefei Zhang (2017). "Topside ionospheric electron temperatures from GPSRO using an Artificial Neural Network model", Poster presentation at 2017 COSMIC & IROWG-6, Estes Park, U.S.
3. **Andong Hu** (2017). The generation of electron/ion temperature from RO measurements from ISR measurements, Oral presentation at Annual Meeting of Chinese Geoscience Union (CGU) (**Excellent Paper Award**), Beijing, China
4. **Andong Hu**, Brett Carter, Julie Currie, Kefei Zhang (2018), Oral Presentation at 18th-Australian Space Science Conference (ASRC), Gold Coast, Australia.
5. **Hu, Andong**, Brett A. Carter, Julie Louise Currie, Enrico Camporeale, Jannis Teunissen, Robert Norman, and Kefei Zhang. "A Deep Neural Network Model of Global Topside Electron Temperature Modeling Using Incoherent Scatter Radars and Its Application to GPS Radio Occultation" AGUFM 2019 (2019): NG31A-0848 (oral).
6. **Andong Hu**, Jannis Teunissen, Manuela Sisti, Francesco Califano, J é r é my Dargent, Giorgio Pedrazzi, and Francesca Delli Ponti. "Using machine learning to identify magnetic reconnection in two-dimensional simulations" EGU 2020 (2020): EGU2020-12160 (oral).
7. **Andong Hu**, Manuela Sisti, Francesco Finelli, Francesco Califano, Matteo Faganello, J é r é my Dargent, Enrico Camporeale and Jannis Teunissen, "Identifying magnetic reconnection in 2D-HVM simulations with CNNs" , AGU 2020 (2020): NG006-01 (oral).
8. Ajay Kumar Tiwari, Benoit Tremblay, **Andong Hu**, Linnea Wolniewicz, Michael Kirk, Silvina Guidoni, Brent Smith, Matthew Penn, Tanmoy Samanta. "SEARCH: SEgmentation of polAR Coronal Holes." Machine Learning and the Physical Sciences Workshop at the 34th Conference on Neural Information Processing Systems (NeurIPS) December 11, 2020.

## **RESEARCH EXPERIENCE**

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1. European Union's Horizon 2020 research and innovation programme under grant agreement No 776262 (AIDA, [www.aida-space.eu](http://www.aida-space.eu)), Centrum Wiskunde & Informatica (CWI) , 2019.8-present
  - Focused on utilising machine learning approaches in astrophysics to investigate the physical mechanisms behind the solar winds.
2. Cooperative Research Centre for Space Environment Management through the Australian Government ' s Cooperative Research Centre Programme., Royal Melbourne Institute of Technology, 2018.7-2019.8
  - Focused on developing ionosphere-thermosphere coupling model using machine learning approaches from GNSS-RO and ISR data.
3. Australian Academic Research (ARC) Linkage Project with Bureau of Meteorology and Boston College: Next Generation Space Weather (LP160100561), Royal Melbourne Institute of Technology, 2017.5-2018.10
  - Focus on ionospheric modelling from GNSS RO measurements by using deep learning approaches for space weather.
  - GNSS Signal reflection detection near the surface using GNSS-RO measurements.

## **HONORS AND AWARDS**

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1. Excellent Paper Award, Annual Meeting of Chinese Geoscience Union (CGU), Beijing, China
2. Top-up Scholarship, Space Environment Research Centre (SERC), 2018-present
3. Full Ph.D Scholarship, China Scholarship Council, 2015-present
4. National Scholarship, top 2% Master students, CUMT, 2015
5. First-class scholarship, top 10% Master students, CUMT, 2014
6. First-class scholarship, top 10% Master students, CUMT, 2013
7. The chairman of Go Association in NUIST, NUIST, 2010-2012