XINYI SHEN, Ph.D.

Civil and Environmental Engineering
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EDUCATION

2012	Ph.D.	***Institute of Remote Sensing and GIS***, Peking University (Global Ranking #65 in US news)	Beijing, China
2007	B.S.	***School of Remote Sensing and Information Engineering,*** Wuhan University Major : Remote Sensing Science and Technology (Honored Graduate)	Wuhan, China

PROFESSIONAL EXPERIENCE

Jan. 2017-present	Assistant Research Professor	Department of Civil & Environmental Engineering **University of Connecticut**	Storrs, CT
Jan. 2015-Dec. 2016	Post-doc	Department of Civil & Environmental Engineering **University of Connecticut**	Storrs, CT
Jan. 2013-Jan. 2015	Post-doc	Advanced Radar Research Center, National Weather Center, **University of Oklahoma** School of Civil Engineering and Environmental Science, **University of Oklahoma**	Norman, OK
Dec. 2009-Jan. 2011	Visitor	School of Civil Engineering and Environmental Science, **University of Oklahoma** Institute of Computational Earth Science **University of California, Santa Barbara**	Norman, OK Santa Barbara, CA

TEACHING EXPERIENCE

2011.3 2012.3	TA	"SAR image interpretation" in "Principle and Approach of Interpreting Remote Sensing Image"	Peking University
2013.10	Guest Lecturer	"Microwave remote sensing on soil moisture retrieval" in "Remote Sensing Hydrology CEES5020"	University of Oklahoma
2016.3-5	Lecturer	"Radar Remote Sensing of Precipitation, ET and Soil Moisture"	University of Connecticut

RESEARCH INTERESTS

Application Fields

    Hydrological Modelling
    Flood Inundation Mapping/Geomorphology
    Soil Moisture Retrieval/Drought
    Microwave Remote Sensing Forward and Inversion Modeling
    Photogrammetry

Theoretical Fields

    Scattering and Emission of Electromagnetic Waves
    Polarimetric Synthetic Aperture Radar/Radiometer
    Radiative Transfer Theory
    Computational Electromagnetics

PUBLICATIONS

Peer Reviewed Journal Papers & Book Chapters

(First authored journal papers and book chapter)

1. **Xinyi Shen*** and Emmanouil Anagnostou (2017) "A Framework to Improve Hyper-Resolution Hydrologic Simulation in Snow-Affected Regions", *Journal of Hydrology, vol.552, pp.1-12,* DOI:10.1016/j.jhydrol.2017.05.048.

2. **Xinyi Shen**, Yiwen Mei and Emmanouil N. Anagnostou*, (2017). "A Comprehensive Flood Events Database in Continental United States" *Bulletin of the American Meteorological Society*, 98 (7), 1493-1502, DOI: 10.1175/BAMS-D-16-0125.1.

3. **Xinyi Shen***, Emmanouil N. Anagnostou*, Yiwen Mei and Yang Hong (2016), "A Global Distributed Basin Morphometric Dataset", *Nature-Scientific Data,* 4:160124*,* DOI: 10.1038/sdata.2016.124.

4. **Xinyi Shen**, Humberto J. Vergara, Efthymios I. Nikolopoulos, Emmanouil N. Anagnostou*, Yang Hong, Zengchao Hao, Ke Zhang and Kebiao Mao, (2017) "GDBC: A Tool for Generating Global-Scale Distributed Basin Morphometry", *Environmental Modelling & Software*, vol. 83, pp. 212–223, DOI: 10.1016/j.envsoft.2016.05.012.

5. **Xinyi Shen,** Yang Hong*, Ke Zhang, and Zengcao Hao (2016), "Refining a Distributed Linear Reservoir Routing Method", *Journal of Hydrologic Engineering*, vol. 22 (3), DOI: 10.1061/(ASCE)HE.1943-5584.0001442.

6. **Xinyi Shen**, Yang Hong, Emmanouil N. Anagnostou, Ke Zhang, and Zengchao Hao, (2016) "An Advanced Distributed Hydrologic Framework-The Development of CREST", *Hydrologic Remote Sensing and Capacity Building*, Chapter 7, Editors, Yang Hong, Yu Zhang and Sadiq Ibrahim Khan, CRC Press, pp.127-138, ISBN13:9781780408101.

7. **Xinyi Shen**, Yang Hong, Qiming Qin, Jeffery Basara and Kebiao Mao (2015). "A Semi-Physical Microwave Surface Emission Model for Soil Moisture Retrieval" *IEEE Transactions on Geoscience and Remote Sensing,* Vol. 53(7), pp. 4079-4090, DOI: 10.1109/TGRS.2015.2390219.

8. **Xinyi Shen**, Yang Hong*, Qiming Qin, Weilin Yuan (2013). "Bare surface soil moisture estimation using double-angle and dual-polarization L-band radar data", *IEEE Transaction on Geoscience and Remote Sensing,* vol.51(7), pp.3931-3942. DOI:10.1109/TGRS.2012.2228209.

9. **Xinyi Shen**, Yang Hong*, Qiming Qin, Weilin Yuan, Sheng Chen, Trevor Grout, and Shaohua Zhao, (2011). "Orientation angle calibration for bare soil moisture estimation using fully polarimetric SAR data", *IEEE Transaction on Geoscience and Remote Sensing*, vol.49(12), pp. 4987-4996, DOI**:** 10.1109/TGRS.2011.2158583.

10. **Xinyi Shen**, Qiming Qin*, Yang Hong and Guifu Zhang, (2012). "A matrix inversion approach of computing T-matrix for axially symmetrical particles of extreme shape and dielectrically large dimension", *Radio Science* vol. 47, RS5005, RS5005, pp. 14, DOI: 10.1029/2011RS004906.

(co-authored paper led by a student)

11. Mei, Y., E.N. Anagnostou, X. Shen, and E.I. Nikolopoulos (2017). Decomposing the satellite precipitation error propagation through the rainfall-runoff processes. Advances in Water Resources, 109, 253-266, doi:10.1016/j.advwatres.2017.09.012.

12. Yiwen Mei, **Xinyi Shen** and Emmanouil N. Anagnostou, (2017). "A Synthesis of Space-time Variability in Multi-component Flood Response" Hydrology and Earth System Sciences, vol. 21, pp.2277-2299.

(co-authored journal papers)

13. Kebiao Mao, **Xinyi Shen**, Zhiyuan Zuo, Ying Ma, Guang Liu and Huajun Tang, (2017). "An Advanced Radiative Transfer and Neural Network Scheme and Evaluation for Estimating Water Vapor Content from MODIS Data", Atmosphere, vol. 8(139), doi:10.3390/atmos8080139.

14. K.B. Mao, Y. Ma, X.L. Tan, **X.Y. Shen**, G Liu, ZL Li, J.M. Chen and L. Xia, (2016). "Global surface temperature change analysis based on MODIS data in recent twelve years", *Advances in Space Research.* vol. 20(18), DOI: 10.1016/j.asr.2016.11.007.

15. Zengchao Hao, Yang Hong, Qiuhong Tang, Youlong Xia, Vijay P. Singh, Fanghua Hao, Hongguang

Cheng, Wei Ouyang, **Xinyi Shen**, "Satellite Remote Sensing Drought Monitoring and Prediction Over the Globe", *Hydrologic Remote Sensing and Capacity Building*, Chapter 4, Editors, Yang Hong, Yu Zhang and Sadiq Ibrahim Khan, CRC Press, ISBN13:9781780408101.

16. Zengchao Hao, Fanghua Hao, Vijay P Singh, Youlong Xia, Wei Ouyang and **Xinyi Shen**, (2016). "A Theoretical Drought Classification Method for The Multivariate Drought Index Based on Distribution Properties of Standardized Drought Indices", *Advances in Water Resources*, 92, 240-247.

17. Zengchao Hao, Fanghua Hao, Youlong Xia, Vijay P Singh, Yang Hong, **Xinyi Shen** and Wei Ouyang, (2015) "A statistical method for categorical drought prediction based on NLDAS-2", *Journal of Applied Meteorology and Climatology,* DOI: 10.1175/JAMC-D-15-0200.1.

18. K.B. Mao, Y. Ma, T.R. Xu, Q. Liu1, J.Q. Han, L. Xia, X. Y. Shen, T. J. He (2015). "A New Perspective about Climate Change", *Scientific Journal of Earth Science*, vol. 5 (1), pp..12-17.

19. Diandong Ren, Lance M. Leslie, Xinyi Shen, Yang Hong, Qingyun Duan, Rezaul Mahmood, Yun Li, Gang Huang, Weidong Guo, Mervyn J. Lynch (2015). "The Gravity Environment of Zhouqu Debris Flow of August 2010 and Its Implication for Future Recurrence", *International Journal of Geosciences*, 2015, 6, 317-325.

20. Sheng Chen, Yang Hong, Qing Cao, Yudong Tian, Junjun Hu, Xinhua Zhang, Weiyue Li, Nicholas Carr, **Xinyi Shen**, and Lei Qiao, (2015). "Intercomparison of Precipitation Estimates from WSR-88D Radar and TRMM Measurement Over Continental United States", *IEEE Transactions on Geoscience And Remote Sensing,* 53(8), 4444-4456.

21. L. Xia, F. Zhao, Y. Ma*, Z. W. Sun, **X. Y. Shen**, and K. B. Mao*, (2015). "An Improved Algorithm for the Detection of Cirrus Clouds in the Tibetan Plateau Using VIIRS and MODIS Data", *Journal of Atmospheric and Oceanic Technology*, vol. 32, pp. 2125-2129, DOI: 10.1175/JTECH-D-15-0063.1.

22. Lang Xia, Kebiao Mao*, Ying Ma, Fen Zhao, Lipeng Jiang, **Xinyi Shen** and Zhihao Qin, (2014). "An Algorithm for Retrieving Land Surface Temperatures Using VIIRS Data in Combination with Multi-Sensors", *Sensors,* Vol. 14, pp.21385-21408; doi:10.3390/s14112138.

23. K.B. Mao, Y. Ma, L. Xia, W.Y. Chen, **X.Y. Shen**, T.J.He, T.R. Xu, (2014). "Global aerosol change in the last decade: An analysis based on MODIS data", *Atmospheric Environment,* 94, 680-686.

24. Mao Kebiao, Ma Ying, Xia Lang, **Shen Xinyi**, Sun Zhiwen, He Tianjue, Zhou Guanhua (2014). "A neural network method for monitoring snowstorm: A case study in southern China", *Chinese Geographical Science*, vol. 24(5), pp. 599-606, doi: 10.1007/s11769-014-0675-4.

25. Kebiao Mao, Ying Ma, **Xinyi Shen**, Baopu Li, Chunyue Li, Zhaoliang Li, (2012). "Estimation of Broadband Emissivity (8-12um) from ASTER Data by Using RM-NN", Optics Express, 20(18): 20096-20101.

26. ZHAO Shao-hua, Qin qi-ming, **SHEN Xin-yi**, et.,al. (2010). "Review of microwave remote sensing on soil moisture monitoring", *Journal of Microwave,* vol. 26(2), pp. 90-96 (in Chinese).

27. YU Fan, ZHAO Ying-shi, and **SHEN Xin-yi,** "Research on microwave two-scale scattering model for conducting random rough surface", *Journal of China University of Mining & Technology*, 39(3), pp.459-464 (in Chinese).

28. YAO Yun-jun, QIN Qi-ming, ZHAO Shao-hua, **SHEN Xin-yi** and SUI Xin-xin. "New index for soil moisture monitoring based on ΔTs-albedo spectral information", *Spectroscopy and Spectral Analysis*, 31(6), pp.1557-1561 (in Chinese).

(Conferences)

29. Yiwen Mei, Efthymios I. Nikolopoulos, Emmanouil N. Anagnostou and **Xinyi Shen**, "Controls on Event-based Catchment Flood Response over Continental United States", AGU Fall Meeting 2017.

30. **Xinyi Shen*** Emmanouil N Anagnostou, Ziyue Zeng, Albert Kettner, Yang Hong (2017) "What is missing？An operational inundation mapping framework by SAR data", AGU Fall Meeting 2017, H53J-1603.

31. **Xinyi Shen*,** Rehenuma Lazin, Emmanouil N. Anagnostou, and Robert G. Brakenridge (2017). "Mapping the recent US Hurricanes Triggered Flood Events in Near Real Time", AGU Fall Meeting

2017, Late-breaking.

32. K.B. Mao, Y. Ma, Z.Y. Zuo, F. Wang, YQ Jiao, **X.Y. Shen**, Q. Liu, (2016) "Which year is the hottest or coldest from 2001 to 2012 based on remote sensing data", *Geoscience and Remote Sensing Symposium (IGARSS), 2016 IEEE International,* 5213-5216.

33. Michael Jastremski, **Xinyi Shen** and Paul Woodworth, (2016). "Planning for Climate Resilient and Fish-Friendly Road/Stream Crossings in Connecticut's Northwest Hills", *72nd Annual Conference of Northeast Fish & Wildlife Agencies*, Annapolis, Maryland.

34. **Xinyi Shen**, Qiming Qin* and Haijian Ma, (2008). "DSM generation of buildings based on corresponding object constraint", *Geoscience and Remote Sensing Symposium, IGARSS 2008. IEEE International* vol. 3, pp.III-1292-III-1295.

35. **Xinyi Shen**, Yang Hong, Dacheng Wang, Humberto J. Vergara and Emmanouil N. Anagnostou, (2015). "A Global-Scale Distributed Geomorphologic Product", 2015 *American Geophysical (AGU) Fall Meeting*, H15B.

36. Xinyi Shen, Yang Hong, Ke Zhang and Humberto A. Vergara. (2014) "CREST v2.1 Refined by a Distributed Linear Reservoir Routing Scheme"), H33G. Advances in Process-Based, Very High Resolution Hydrological Modeling Across Scales I Posters, 2014 *American Geophysical (AGU) Fall Meeting*.

37. H Ma, Q Qin, **X Shen,** (2008). "Shadow segmentation and compensation in high resolution satellite images". *IGARSS 2008*, vol. 2, Boston, MA, pp.II-1036 - II-1039. 10.1109/IGARSS.2008.4779175

38. **Xinyi Shen**, Qiming Qin*, Yang Hong, et. al (2010). "An enhanced microwave backscattering canopy scattering model based on mimics", *American Geophysical Union 2010 Fall Meeting*. (San Francisco, Dec.12-17, 2010, oral presentation).

Manuscripts under review

1. Xinyi Shen, Emmanouil N. Anagnostou, George H. Allen, Robert G. Brakenridge and Albert J. Kettner. "Near-Real Time Inundation Mapping by Synthetic Aperture Radar (SAR)" *Remote Sensing of Environment,* major revision.

2. Yiwen Mei, Efthymios I. Nikolopoulos, **Xinyi Shen** and Emmanouil N. Anagnostou "Controls on Event-Based Catchment Flood Response over the Continental United States", submitted to *Water Resources Research.*

3. Sage Hardesty, **Xinyi Shen**, Efthymios Nikolopoulos, Emmanouil Anagnostou, "A Numerical Framework for Evaluating Flood Inundation Risk under Different Dam Operation Scenarios", submitted to *Water.*

Manuscripts in preparation

1. **Xinyi Shen**, et. al., "Mapping recent (2016-2017) hurricane and typhoon events triggered inundation", (in preparation).

2. Qing Yang, Xinyi Shen* and Emmanouil N. Anagnoustou, "Regional Flood Frequency Analysis, Sparse Observation or Biased Simulation?" (in preparation).

3. **Xinyi Shen**, et. al. "A Coupled Hydrological and Remote Sensing Soil Moisture Estimation Framework" (in preparation).

4. **Xinyi Shen**, et al., "Geomorphologic-flood Vulnerability Mapping in the CONUS" (in preparation).

PATENTS

Qin Qi-ming, **SHEN Xin-yi** and Zhao Shao-hua, *"A roughness pin-meter"* (applied in 2009, authorized in 2012). CN101776448A, *China Invention Model Patent*.

SERVICE

Editorial Board

Associate Editor*, Journal of Hydrology*

Guest Editor, *Water* (Special Issue: "Assessment of Current and Future Vulnerability of Flooding with Hydrologic Modeling and Remote Sensing Techniques")

Review Editor, *Frontiers in Big Data and AI*

Peer Reviewer

General

Nature-Scientific Report
Stochastic Environmental Research and Risk Assessment

Hydrology & Meteorology

Advances in Meteorology
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Journal of Water Resources Planning and Management

Remote Sensing & Photogrammetry

Remote Sensing
Remote Sensing of Environment
IEEE Transactions on Geoscience and Remote Sensing
IEEE Geoscience and Remote Sensing Letters
IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing
International Journal of Remote Sensing
Photogrammetric Engineering & Remote Sensing
Journal of Remote Sensing Technology

Electromagnetics

Radio Science

Technical Program Committee of

The 3rd International Conference on Civil Engineering and Urban Planning, Dec. 2013 Wuhan, China.

Proposal Reviewer of

NASA Experimental Program to Simulate Competitive Research (EPSCoR).

PROJECT EXPERIENCE

1. 2019.4-2021.3, "Automated Flood Inundation Mapping by NISAR", NASA 2018-ROSE Program, Role, PI, (proposal to be submitted).
2. 2018.9-2019.3, "Sewer Backup Risk Score", $45k, Sponsored by Travelers, Role, PI.
3. 2019.1-2019.12, "Pumped-hydroelectric energy storage from water supply reservoirs in New England: potential, challenges and opportunities" (Phase A), 150k, Role, CoPI.
4. 2018.1-2018.12, "Planning for Climate Resilient and Fish-Friendly Road/Stream Crossings in Connecticut's Northwest Hills", $25k. Sponsored by Housatonic Valley Association, (Continuation of the 2017 project), Role: PI.
5. 2018.1-2019.12 "Real-Time and Early Warning System of Substations Vulnerability during Storm-Flood Events" $245,000 *Eversouce Energy Service Co.*, (awarded/continuation of the 2016-2017 project), Role: PI.
6. 2016-2121, "Taming water in Ethiopia - A collaborative multidisciplinary research to improve human security in a water dependent emerging region", NSF-Partnerships for International Research and Education (PIRE), $4.3M, Role: member in US research team, (http://pire.engr.uconn.edu/).
7. 2016.10-2017.12, "Evaluation of Substations Vulnerability of Flooding in Current and Climate Change Scenarios" $145,000, *Eversouce Energy Service Co.*, Role: PI, (http://www.eversource.uconn.edu/recipients-of-over-750k-of-eversource-funding-announced.html).
8. 2016.1-2018.12, "Municipal Resilience Planning Assistance Project", $170,000, sponsored by Connecticut Department of Housing & Urban Development (HUD), Awarded/Active (http://circa.uconn.edu/projects/municipal-resilience-planning/)
9. 2015.1-2016.12, "Flood Vulnerability Analysis of Connecticut Inland River Network", $205,000, sponsored by *Connecticut Institute for Resilience & Climate Adaptation (CIRCA)* and *Connecticut Department of Energy & Environmental Protection (CT DEEP)*, Awarded, CoI,

(http://circa.uconn.edu/projects/flood-prediction/).

10. 2016.3-2016.11, "Planning for Climate Resilient and Fish-Friendly Road/Stream Crossings in Connecticut's Northwest Hills", $25,000. Sponsored by Housatonic Valley Coalition Against Substance Abuse, Inc., Awarded/Active, CoI.

11. 2016.3-2017.2"Resiliency Analysis to Storm Surge for I-95 Right-of-Way at Long Wharf / New Haven, CT", $90,000. Sponsored by Connecticut Department of Transportation (ConnDOT), Awarded/Active, Role: Collaborator.

12. 2015.1-2018.12 "Drought Monitoring Based on Coupling Distributed Hydrologic and Microwave Remote Sensing Models", General Program, ￥850000 (~$136000), sponsored by 2014 *National Natural Science Foundation of China (NSFC)*, CoI.

13. 2014.1-2014.9 "Flood Risk Pre-estimation based on a distributed hydrological model", open-fund sponsored by *Disaster Alleviation Center, China Civil Administration & People's Insurance Company China (PICC)*, ￥90000 (~$14500), CoI (http://hydrosky.org/Qhcontent/index/id/626/aid/544444630/fid/109).

14. 2011-2012 "Remote Sensor Validation Loaded on Unmanned Aerial Vehicle (UAV)", national high technology research and development program (863 program), Project No.: 2008AA121806, Role: student participant.

15. 2009-2010 "Drought Information retrieval Using Temporal and Multi-source Remote Sensing data", national high technology research and development program (863 program), Project No.:2009AA12Z128, Role: student participant.

16. 2008-2009, "Remote sensing over Black River Basin", Major State Basic Research Development Program (973 program), Project No. 2007CB714400. Role: student participant, Duty: drought index establishment.

17. 2008-2011 "Agricultural drought monitoring and resistance based on multi-dimensional spectrum", Public Service Special Funding in Meteorology, Project No.: GYHY200806022, Role: student participant.

18. 2006-2007 "Image Segmentation based on Object Oriented Approach", Student Novelty Funding of Wuhan University. Role: PI.