

XIAO HUANG

Ph.D. Department of Geosciences, University of Arkansas
227 N. Harmon Ave., Fayetteville, AR, 72701
xh010@uark.edu, (470)265-5578
Personal website: www.xiaohuang116.com

EDUCATION

- 2020 **Ph.D.** Department of Geography, University of South Carolina, Columbia, SC, USA
- 2016 **M.S.** School of City Planning & Architecture, Georgia Institute of Technology, Atlanta, GA, USA
- 2015 **B.S.** School of Remote Sensing and Information Engineering, Wuhan University, Wuhan, Hubei Province, China

EMPLOYMENT

- 2020-present **Assistant professor**, Department of Geosciences, University of Arkansas, Fayetteville, AR, USA
- 2016-2020 **Graduate Research and Teaching Assistant**, Department of Geography, University of South Carolina, Columbia, SC, USA

RESEARCH INTERESTS

Geospatial analysis and environmental modeling
Big data analytics
Spatial and social data mining via deep learning
Remote sensing in natural hazards
Geovisualization

AWARDS, GRANTS, AND SCHOLARSHIPS

Awards

- 2019 Second Place in Student Paper Competition, the 42nd of the Applied Geography Conference, Charlotte, NC, October 23rd-25th. (\$100)
- 2019 Breakthrough Graduate Scholar, University of South Carolina.
- 2019 The Paul E. Lovingood Graduate Research Award. (\$500)
- 2019 Second Place in Robert Raskin Student Paper Competition, American Association of Geographers (AAG) Cyberinfrastructure Specialty Group (CISG), Washington, DC, April 3rd-April 7th. (\$200)
- 2018 Second Place in Remote Sensing Specialty Group (RSSG) Student Paper Competition, American Association of Geographers (AAG), New Orleans, LA, April 10th-April 14th. (\$200)

- 2017 First Place Student Paper Award, the 25th International Conference on GeoInformatics, Buffalo, OH, August 3rd. (\$500)
- 2013 Outstanding investigator, Lake Management and Protection in City of Wuhan, Hubei Province, China, April 15th.
- 2012 Outstanding engineer, School of Remote Sensing and Information Engineering, Wuhan University, September 3rd.

Grants and Scholarships

- 2019 Teaching Resource Development Grant, Center for Teaching Excellence, University of South Carolina. (\$750)
- 2019 Travel Grant, Japan Local Organizing Committee to the International Cartographic Association, for the participation in the bi-annual International Cartographic Conference (ICC 2019). (¥100,000)
- 2019 Travel Fund, U.S National Committee (USNC) to the International Cartographic Association, for the participation in the bi-annual International Cartographic Conference (ICC 2019). (\$2000)
- 2019 International Cartographic Association Scholarship (ICA), International Cartographic Association. Funded article: *Linking picture with text: tagging flood relevant tweets for rapid flood inundation mapping*. (€400)
- 2019 The SPARC Graduate Research Grant, sponsored by the Office of the Vice President for Research, University of South Carolina. Funded project: *A Deep Learning Supported Flood Mapping Framework that Integrates Remote Sensing and Social Sensing*. (\$5000)
- 2019 The Graduate School Travel Grant, University of South Carolina, for the participation in the Association of American Geographers Annual Meeting, April 2nd - April 7th, 2019. Funded presentation: *Identifying disaster related social media for rapid response: a visual-textual fused approach*. (\$500)
- 2018 The Graduate School Travel Grant, University of South Carolina, for the participation in the Association of American Geographers Annual Meeting, April 10th - April 14th, 2018. Funded presentation: *Reconstructing flood inundation probability by enhancing near real-time imagery with real-time gauges and tweets*. (\$500)
- 2013 China Soong Ching Ling Foundation, Lake Management and Protection Program, City of Wuhan, Hubei Province, China. (\$750)
- 2013 National Second-Class Scholarship, Wuhan University (WHU). (\$500)
- 2012 National Second-Class Scholarship, Wuhan University (WHU). (\$500)

PUBLICATIONS

Refereed Journal Articles

- Huang, X.**, & Wang, C. (2020). Estimates of exposure to the 100-year floods in the conterminous United States using national building footprints. *International Journal of Disaster Risk Reduction*, doi: 10.1016/j.ijdr.2020.101731.
- Huang, X.**, Wang, C., Li, Z., & Ning, H. (2020). A 100 m population grid in the CONUS by disaggregating census data with open-source Microsoft building footprints. *Big Earth Data*, 10.1080/20964471.2020.1776200.
- Lu, J., Carbone, G. J., **Huang, X.**, Lackstrom, K., & Gao, P. (2020). Mapping the sensitivity of agriculture to drought and estimating the effect of irrigation in the United States, 1950–2016. *Agricultural and Forest Meteorology*, 292, 108124.
- Xu, D., **Huang, X.**, Li, Z., & Li, X. (2020). Local Motion Simulation using Deep Reinforcement Learning, *Transactions in GIS*, doi: 10.1111/tgis.12620.
- Ning, H., **Huang, X.**, Wang, C., & Li, Z (2020). Detection new building construction in urban areas based on images of small unmanned aerial system. *Papers in Applied Geography*, doi: 10.1080/23754931.2019.1707108.
- Huang, X.**, Wang, C. Lu, J., & Ning, H. (2019). Understanding spatiotemporal development of human settlement in hurricane-prone areas on U.S. Atlantic and Gulf Coasts using nighttime remote sensing, *Natural Hazards and Earth System Sciences*, doi: 10.5194/nhess-19-2141-2019.
- Huang, X.**, Wang, C. Li, Z., & Ning, H. (2019). Identifying disaster related social media for rapid response: a visual-textual fused CNN architecture. *International Journal of Digital Earth*, doi: 10.1080/17538947.2019.1633425.
- Huang, X.**, Wang, C. Li, Z., & Ning, H. (2018). A visual-textual fused approach to automated tagging of flood-related tweets during a flood event. *International Journal of Digital Earth*, doi: 10.1080/17538947.2018.1523956.
- Huang, X.**, Wang, C., & Li, Z. (2018). Reconstructing flood inundation probability by enhancing near real-time imagery with real-time gauges and tweets. *IEEE Transactions on Geoscience and Remote Sensing*, 56(8), 4691-4701.
- Huang, X.**, Wang, C., & Li, Z. (2018). A near real-time flood-mapping approach by integrating social media and post-event satellite imagery. *Annals of GIS*, 24(2), 113-123.
- Wang, C., Li, Z., & **Huang, X.** (2018). Geospatial Assessment of Wetness Dynamics in the October 2015 SC Flood with Remote Sensing and Social Media. *Southeastern Geographer*, 58(2), 164-180.
- Li, H., Wang, C., **Huang, X.**, & Hug, A. (2018). Spatial Assessment of Water Quality with Urbanization in 2007–2015, Shanghai, China. *Remote Sensing*, 10(7), 1024.

Refereed Articles In Review

- Xu, D., **Huang, X.**, Li, Z. Multi Exit Evacuation Simulation based on Deep Reinforcement Learning, *Transactions in GIS*. In Review.

Huang, X., Li, Z., Jiang, Y., Deng, C., Zhang, J. The Characteristics of multi-source mobility datasets and how they reveal the luxury nature of social distancing in the US during the COVID-19 pandemic. *Applied Geography*. In Review.

Huang, X., Li, Z., Jiang, Y., Li, X., Porter, D. Twitter, human mobility, and COVID-19., *PLOS ONE*. In Review.

Zhang, R., Shao, Z., **Huang, X.**, Wang, J., Li, D. Object detection in UAV images via global density fused convolutional network. *Remote Sensing*. In review.

Zhang, R., Shao, Z., Li, D., Wang, J., Wang, Y., **Huang, X.** Adaptive dense pyramid network for objection in UAV imagery. *Pattern Recognition*. In review.

Refereed Articles In Preparation

Huang, X., & Wang, C. Exploring the capability of satellite imagery in estimating population distribution via deep learning, *Remote Sensing*. In Preparation.

Huang, X., Wang, C, & Li, Z. Burst-based social sensing of infrastructure disruptions during disasters, *Transactions in GIS*. In Preparation.

Huang, X., Wang, C., & Mitra, A. Dynamics of human proximity to rivers in India after major floods using nighttime remote sensing, *International Journal of Disaster Risk Reduction*. In Preparation.

Huang, X., Xu, D., Li, Z., & Wang, C. (2019). The potential of conditional generative network in translating multispectral imagery to nighttime imagery, *International Journal of Geo-Information*. In Preparation.

Xu, D., **Huang, X.**, Li, Z. Agent-based evacuation simulation based on different mass panic scenarios, *Transactions in GIS*. In Preparation.

Li, H., **Huang, X.**, Jia, M., Li, X., Wang, Z. Quantifying the changes in ecosystem service in Liaoning Province, China as a result of climate variability and land cover change. In preparation.

Ning, H., Li, Z., Hodgson, M., & **Huang, X.** Building Area Detection in Remote Sensing Image Based on Sliding Window and Existing Point Labels using Convolutional Neural Networks. In Preparation.

Refereed Conference Papers

Huang, X., Xu, D., Li, Z., & Wang, C. (2020). Translating multispectral imagery to nighttime imagery via conditional generative network. *2019 IEEE International Geoscience and Remote Sensing Symposium* (accepted).

Huang, X., Wang, C., & Li, Z. (2019). Linking picture with text: tagging flood relevant tweets for rapid flood inundation mapping. *Proceedings of the International Cartographic Association*, 2, 45, doi: 10.5194/ica-proc-2-45-2019.

Huang, X., Wang, C, & Li, Z. (2019). High-Resolution Population Grid in the CONUS using Microsoft Building Footprints: A Feasibility Study. *Proceedings of the 3rd ACM SIGSPATIAL Workshop on Geospatial Humanities*, doi: 10.1145/3356991.3365469.

Huang, X., & Wang, C. (2019). Human settlement dynamics in hurricane-prone zones of CONUS: view from nighttime remote sensing perspective. *2019 IEEE International Geoscience and Remote Sensing Symposium*, doi: 10.1109/IGARSS.2019.8899106.

Other Publications

Huang, X. (2020). Remote Sensing and Social Sensing for Improved Flood Awareness and Exposure Analysis in the Big Data Era. (Doctoral dissertation). Retrieved from <https://scholarcommons.sc.edu/etd/5851>

Huang, X. (2019). The fusion of remote sensing and social sensing in rapid flood mapping: motivation, opportunities and challenges, *US National Report (US National Committee for the International Cartographic Association)*: <https://cartogis.org/usnc-ica/us-national-report/>.

Huang, X. (2017). A Future Energy Harvesting Scenario for Georgia Tech Campus Using Photovoltaic Solar Panels and Piezoelectric Materials. *MS-GIST Capstone Paper*, Georgia Institute of Technology.

CONFERENCES

Oral Presentations (* for presenting author)

Huang, X.*, Xu, D., Li, Z., & Wang, C. 2020. Translating multispectral imagery to nighttime imagery via conditional generative adversarial network. *2020 IEEE International Geoscience and Remote Sensing Symposium*, Waikoloa, Hawaii, USA, July 19th - July 24th.

Huang, X.* (Invited panelist). 2019. Sensing and Improving Rapid Flood Mapping through Social Media Data Mining. *Fall research seminar series in School of City & Regional Planning*, Georgia Institute of Technology, Atlanta, GA, September 27th.

Huang, X.* (invited panelist). 2019. Deep learning in social media retrieval for rapid flood mapping. *U.S Geological Survey: leveraging Crowdsourcing, Citizen Science, and Social Media to Produce Volunteer Geographic Information (VGI) for Hazard Science*, Disaster Research, and Emergency Management, D.C, April 6th.

Huang, X.* (invited speaker). 2019. Combining virtual geographic environment and fieldwork to promote efficient learning in Geography. *Oktoberfest: A Celebration of Teaching*, UoSC Russell House, Oct 18th.

Huang, X.*, & Wang, C. 2019. Social media data mining in supporting rapid flood inundation mapping. *The 74th Annual Meeting of SouthEastern Division of the American Association of Geographers*, Wilmington, NC, November 24th - 25th.

Huang, X.*. 2019. Generating population grid in the CONUS by disaggregating census population with Microsoft building footprints. *The 74th Annual Meeting of SouthEastern Division of the American Association of Geographers*, Wilmington, NC, November 24th - 25th.

Huang, X.*, Wang, C., & Li, Z. 2019. High-Resolution Population Grid in the CONUS using Microsoft Building Footprints: a feasibility study. *The 3rd ACM SIGSPATIAL Workshop on Geospatial Humanities*, Chicago, IL, November 5th - 8th.

- Huang, X.***. 2019. A high-resolution population grid in the CONUS based on Microsoft building footprints and its potentials in hazard studies. *Applied Geography Conference*, Charlotte, NC, October 23rd - 25th.
- Huang, X.***, Wang, C., & Li, Z. 2019. Linking picture with text: tagging flood relevant tweets for rapid flood inundation mapping, *2019 International Cartographic Conference*, Tokyo, Japan, July 15th - 20th.
- Huang, X.***, Li, Z., & Wang, C. 2019. Identifying disaster related social media for rapid response: a visual-textual fused approach, *AAG Annual Meeting*, AAG Cyberinfrastructure Specialty Group (CISG), DC, April 3rd - 7th.
- Wang, C.*, Morgan, G., Hodgson, M., **Huang, X.** 2019. Drone based 3D Tree Structure Surveying on Earth Dams to Assist Dam Safety. *The 74th Annual Meeting of SouthEastern Division of the American Association of Geographers*, Wilmington, NC, November 24th - 25th.
- Wang, C.*, & **Huang, X.** 2018. Integration of social sensing and remote sensing for situation awareness of coastal floods. *The 3rd Conference of Digital Belt and Road (DBAR)*, Tengchong, Yunnan Province, China, December 5th - 7th.
- Wang, C.*, & **Huang, X.** 2018. Rapid flood inundation mapping via integrated social sensing and Earth sensing. *2018 SEDAAG Annual Meeting*, Johnson City, TN, November 8th - 19th.
- Wang, C.*, & **Huang, X.** 2018. Rapid flood inundation reconstruction by integrating social media and satellite imagery. *Applied Geography Conference*, Kent, OH, October 31st – November 2nd.
- Huang, X.***, Wang, C., & Li, Z. 2018. Reconstructing flood inundation probability by enhancing near real-time imagery with real-time gauges and tweets, *AAG Annual Meeting*, Remote Sensing Specialty Group (RSSG), New Orleans, LA, April 13th.
- Huang, X.***, Wang, C., & Li, Z. 2017. A near real-time flood mapping approach by integrating social media and post-event satellite imagery, *The 25th International Conference on GeoInformatics*, Buffalo, OH, August 3rd.
- Huang, X.***. 2016. A future energy harvesting scenario for Georgia Tech campus using photovoltaic solar panels and piezoelectric materials, *Georgia Tech Capstone Project Presentation*, Georgia Institute of Technology, Atlanta, GA, July 23rd.
- Huang, X.***. 2014. A LiDAR point cloud filter considering topographic features, *The 2015 Wuhan University undergraduate thesis competition*, Wuhan University, Wuhan, Hubei Province, China, April 12th.

Poster Presentations (* for presenting author)

- Huang, X.***, & Wang, C. 2019. Human Settlement in Hurricane-prone Areas on U.S. Atlantic and Gulf Coasts: a view from nighttime remote sensing, *Discover UoSC at Columba Metropolitan Convention Center*, April 26th.
- Huang, X.***, Wang, C., & Li, Z. 2019. Human Settlement Dynamics in Hurricane-prone Zones of Conterminous U.S: A View from Nighttime Remote Sensing, *2019 IEEE International Geoscience and Remote Sensing Symposium*, Pacifico Yokohama, Japan, July 28th - August 2nd.

Huang, X.*, & Wang, C. 2018. Flood monitoring using remote sensing and social sensing. 2017 GIS day, University of South Carolina, November 14th.

SELECTED MEDIA

- 2019 Research highlight by the Spatial Analysis and Modeling Specialty Group (SAM) in American Association of Geographers, “100-year Flood Exposure in the Conterminous United States Using National Building Footprints”,
https://docs.wixstatic.com/ugd/4a5b75_9434b078133b45e0b5dba453e075fe40.pdf
- 2019 Research highlight by the Hazards, Risks, and Disaster Specialty Group (HRD) in the American Association of Geographers: “Human settlement in hurricane-prone areas”,
https://docs.wixstatic.com/ugd/4a5b75_2b88057e41c9489483088b79018751a7.pdf
- 2019 Research highlight by the Applied Geography Specialty Group (AGSG) in the American Association of Geographers, “Human Settlement in Hurricane-Prone Zones is Revealed by Nighttime Remote Sensing”,
https://docs.wixstatic.com/ugd/4a5b75_2c6511375189498ba6287fc53af0f18c.pdf
- 2019 Research highlight by the Cyberinfrastructure Specialty Group (CISG) in American Association of Geographers, “Visual-textual fused CNN architecture for rapid disaster related social media retrieval” (scheduled in Dec 2019).
https://docs.wixstatic.com/ugd/4a5b75_cca08cb9c381485eb9fac8bc32f341f0.pdf

INVITED TALKS/PRESENTATIONS

- 2020 **Huang, X.:** *Big Geospatial Data in Assisting Disaster Assessment*, Research Colloquium, University of Arkansas, AR, Feb 14th.
- 2019 **Huang, X.:** *Potential Applications of Nighttime Remote Sensing*, GEOG 105 (The Digital Earth), University of South Carolina, Columbia, SC, Oct 15th.
- 2018 **Huang, X.:** *Remote Sensing and Social Sensing in Rapid Flood Mapping*, GEOG 105 (The Digital Earth), University of South Carolina, Columbia, SC, April 18th.

TEACHING EXPERIENCE

- 2018-present **Instructor** of *Geographic Information Systems (GEOG 363)*
Principles and methods of geographic information systems; modeling the Earth and abstracting geographical data; spatial data display and spatial data analysis; applications and hands-on experience.
Course evaluation (out of 5): 2018 Fall: **4.96**
- 2017-2018 **Instructor** of *The Digital Earth (GEOG 105) (Carolina Core ARP)*
Introduction to geographic data; use of digital maps and aerial/satellite images as means of Earth observation; basics of spatial data analysis; location-based Web APPs; digital map services.

Course evaluation (out of 5): 2019 Fall: **N/A**; 2018 Summer: **5.0**; 2018 Spring: **4.78**; 2017 Fall: **4.73**

RESEARCH EXPERIENCE

2018-present Regional Geospatial Analysis

Created high-resolution population grid dataset that covers the entire CONUS using newly released Microsoft national building footprints, designed interactive user interface for data sharing and downloading, and coupled high-resolution population product with floodplains from different agencies to generate detailed profiles of 100-year flood exposure in the CONUS. (two papers under review)

2018-present Dynamics of Human Settlement Intensity in Hurricane-prone Areas from Nighttime Remote Sensing

Identified hurricane proneness using historical storm tracks, desaturated traditional DMSP/OLS nighttime imagery using NDVI derived from AVHRR and MODIS, and explored the spatiotemporal dynamics of human settlement in areas with high hurricane proneness in the CONUS. (one published paper)

2018-present Sensing and Improving Disaster resilience through Social Media Data Mining (deep learning analytics)

Designed a visual/textual fused artificial intelligence to automatically classify disaster related social media leveraging state-of-the-art convolutional neural networks. (two published papers)

2016-present Remote Sensing and Social Sensing in Rapid Flood Awareness Acquisition and Inundation Mapping

Designed flood geostatistical models that integrate remotely sensed moisture with socially sensed responses for better flood awareness acquisition and comprehensive inundation mapping. (two published papers)

2015-2016 Energy Harvesting Scenarios (solar and piezoelectric) using GIS-based Techniques

Case study: Georgia Tech campus

Determined the optimal locations to install solar and piezoelectric materials using GIS techniques, and estimated the potential generated energy and costs. (Master capstone project)

SERVICE

Academic Service

2018-2020 Student board member, Applied Geography Specialty Group, American Association of Geographers.

Departmental and School Service

2018-2019 Discover USC Reviewer, Office of the Vice President for Research, University of South Carolina.

- 2018-2019 Thinking Globally Ambassador, International Student Service, University of South Carolina.
- 2016-present Member, Geography Graduate Student Association (GGSA), University of South Carolina.
- 2016-2018 Member, Chinese Student Association, University of South Carolina.
- 2018-2019 Organizing committee, Geography Professional Development Workshop, University of South Carolina.
- 2017-2018 Organizing committee, 2017 GIS day, University of South Carolina.

Public Outreach

- 2014 Local volunteer reception, Wuhan local reception committee of Association internationale des étudiants en sciences économiques et commerciales (AIESEC) global volunteer program, Wuhan, China, June 10th - August 10th.
- 2013 International volunteer, Association internationale des étudiants en sciences économiques et commerciales (AIESEC) global volunteer program, Egypt, Africa, June 16th - August 3rd.
- 2013 International volunteer, Association internationale des étudiants en sciences économiques et commerciales (AIESEC) global volunteer program, Tunisia, Africa, May 15th - June 15th.
- 2013 Student investigator, Lake Management and Protection Program, Wuhan, Hubei Province, China. March 15th - September 27th.

Scholarly/Professional Organizations

- 2018-present Institute of Electrical and Electronics Engineers (IEEE) student member
- 2018-present International Center for Excellence on Big Earth Data for Coasts, DBAR International Science Program.
- 2017-present American Association of Geographers (AAG)
- 2017-present Southeastern Division of the American Association of Geographers (SEDAAG)
- 2017-present International Association of Chinese Professional in Geographic Information Sciences (CPGIS)
- 2017-present American Geographic Society (AGS)

Journal Reviews (Year[Times])

- Annals of GIS (2020 [4])
- IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing (2020 [1])
- International Journal of Digital Earth (2018[2])
- Papers in Applied Geography (2019[3])
- Journal of ambient intelligence and humanized computing (2020 [4])
- Applied Geography (2020 [4])

IEEE Transactions on Geoscience and Remote Sensing (2020 [1])