Changshan Wu
Professor
Department of Geography
University of Wisconsin-Milwaukee
Bolton Hall 482
P.O. Box 413
Milwaukee, WI 53201-0413
(414) 2294860 (Office)
(414)2293981 (fax)
cswu@uwm.edu (e-mail)

EMPLOYMENT

2013 – Present	Professor, Department of Geography, University of Wisconsin-Milwaukee
2008 – 2013	Associate Professor, Department of Geography, University of Wisconsin-Milwaukee
2003 – 2008	Assistant Professor, Department of Geography, University of Wisconsin-Milwaukee

OTHER APPOINTMENTS

2018 – Present	President, International Association of Chinese Professionals in Geographic Information Sciences (CPGIS)
2017 – 2019	Chair, Remote Sensing Specialty Group, American Association of Geographers
2016 – Present	Associate Chair, Department of Geography, University of Wisconsin-Milwaukee
2013-14/15-16	Chair, Department of Geography, University of Wisconsin-Milwaukee
2010 – 2013	Graduate Program Chair, Department of Geography, University of Wisconsin – Milwaukee
2010 – 2013	Associate Chair, Department of Geography, University of Wisconsin – Milwaukee
2018 – Present	Editorial board member, Applied Geography (SSCI), PLOS One (SCI), Remote Sensing (SCI)
2013 – Present	Editorial board member, International Journal of Environmental Science and Technology (SCI)

EDUCATION

2003 Ph.D., Geographical Information Science
Department of Geography
Ohio State University, Columbus, Ohio
Dissertation: *Remote Sensing, Geographical Information Systems, and Spatial Modeling for Analyzing Public Transit Services*
Advisor: Alan T. Murray

1999 M.S., Cartography and GIS
Institute of Remote Sensing Applications, Chinese Academy of Sciences, Beijing, P.R. China
Thesis: *Estimating Crop Biophysical Parameters Using Multitemporal Hyperspectral Data*
Advisor: Qingxi Tong (Academician) and Lanfen Zheng

1995 B.S., Department of Urban and Environmental Sciences, Peking University, Beijing, P.R. China

AREAS OF SPECIALIZATION

Remote sensing, Geographical information science, Spatial analysis and quantitative methods, Land use/cover, Water quality, Housing, Transportation

PUBLICATIONS

Refereed Journal Papers (* denotes corresponding author)

2019 Wei Fan, Changshan Wu*, and Jin Wang, “Improving impervious surface estimation by using remote sensed imagery combined with open street map points-of-interest (POI) data”, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, In Press

2019 Yingbin Deng and Changshan Wu*, Examining the effectiveness of spectrally transformed SMA in urban environments, *Photogrammetric Engineering and Remote Sensing*, In Press.

2019 Yingbin Deng, Changshan Wu*, Xin Zhang, and Xiuping Jia. "Examining the

effectiveness of weighted spectral mixture analysis (WSMA) in urban environments." *International Journal of Remote Sensing* 40, no. 8: 3055-3075.

2019 Bahram Khazaei, Sina Khatami, Seyed Hamed Alemohammad, Lida Rashidi, Changshan Wu, Kaveh Madani, Zahra Kalantari, Georgia Destouni, and Amir Aghakouchak."Climatic or regionally induced by humans? Tracing hydro-climatic and land-use changes to better understand the Lake Urmia tragedy." *Journal of Hydrology* 569: 203-217.

2018 Haijian Liu and Changshan Wu* "Incorporating crown shape information for identifying ash tree species." *Photogrammetric Engineering & Remote Sensing* 84, no. 8: 495-503.

2018 Haijian Liu and Changshan Wu*. "Crown-level tree species classification from AISA hyperspectral imagery using an innovative pixel-weighting approach." *International Journal of Applied Earth Observation and Geoinformation* 68 (2018): 298-307.

2018 Wei Xu and Changshan Wu*. "Detecting spatiotemporal clusters of dementia mortality in the United States, 2000–2010." *Spatial and Spatio-temporal Epidemiology* 27: 11-20.

2018 Yang Song, Changshan Wu*, Examining human heat stress with remote sensing technology, *GIScience & Remote Sensing* 55 (1), 19-37

2018 Xiaodong Na, Shuying Zang, Changshan Wu*, Ying Tian, Wenliang Li, Hydrological Regime Monitoring and Mapping of the Zhalong Wetland through Integrating Time Series Radarsat-2 and Landsat Imagery, Remote Sensing 10 (5), 702

2018 Xiaodong Na, Haitao Zhou, Shuying Zang, Changshan Wu*, Wenliang Li, and Miao Li. "Maximum Entropy modeling for habitat suitability assessment of Red-crowned crane." *Ecological Indicators* 91 (2018): 439-446.

2018 Jike Chen, Peijun Du*, Changshan Wu, Junshi Xia, and Jocelyn Chanussot. "Mapping urban land cover of a large area using multiple sensors multiple features." *Remote Sensing* 10, no. 6 (2018): 872.

2018 Wenliang Li, Changshan Wu, and Woonsup Choi. "Predicting future urban impervious surface distribution using cellular automata and regression analysis." *Earth Science Informatics* 11, no. 1: 19-29.

2018 Jin Wang, Zhifeng Wu*, Changshan Wu, Zheng Cao, Wei Fan, Paul Tarolli, Improving impervious surface estimation: an integrated method of classification and regression trees (CART) and linear spectral mixture analysis (LSMA) based on error analysis, *GIScience & Remote Sensing* 55 (4), 583-603

2018 Miao Li, Shuying Zang, Changshan Wu, Xiaodong Na, Spatial and temporal variation of the urban impervious surface and its driving forces in the central city of Harbin, *Journal of Geographical Sciences* 28 (3), 323-336

2018 Xiang Xu, Jun Li*, Changshan Wu, Antonio Plaza, Regional clustering-based spatial preprocessing for hyperspectral unmixing, *Remote Sensing of Environment* 204, 333-346

2018 Lin Bai, Cuizhen Wang, Shuying Zang, Changshan Wu, Jinming Luo, and Yuexiang Wu. "Mapping Soil Alkalinity and Salinity in Northern Songnen Plain, China with the HJ-1 Hyperspectral Imager Data and Partial Least Squares Regression." *Sensors* 18, no. 11: 3855.

2018 Changyu Zhu, Jun Li*, Shaoquan Zhang, Changshan Wu, Bing Zhang, Lianru Gao, and Antonio Plaza. "Impervious surface extraction from multispectral images via morphological attribute profiles based on spectral analysis." IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 11, no. 12 (2018): 4775-4790.

2017 Li, Wenliang, and Changshan Wu*. "A geographic information-assisted temporal mixture analysis for addressing the issue of endmember class and endmember spectra variability." Sensors 17, no. 3 (2017): 624.

2017 Choi, Woonsup, Feng Pan, and Changshan Wu. "Impacts of climate change and urban growth on the streamflow of the Milwaukee River (Wisconsin, USA)." Regional Environmental Change 17, no. 3 (2017): 889-899.

2017 Jiang, Changbo, Yizhuang Liu, Yuannan Long, and Changshan Wu. "Estimation of Residence Time and Transport Trajectory in Tieshangang Bay, China." Water 9, no. 5 (2017): 321.

2016 Liu, Haijian, and Changshan Wu*. "Tree Crown width estimation, using discrete airborne LiDAR data." *Canadian Journal of Remote Sensing* 42, no. 5 (2016): 610-618.

2016 Yang Song and Changshan Wu*, Examining the impact of urban biophysical composition and neighboring environment on surface urban heat island effect, *Advances in Space Research*, 57 (1), 96-109.

2016 Wenliang Li and Changshan Wu*, A geostatistical temporal mixture analysis approach to address endmember variability for estimating regional impervious surface distributions, *GIScience & Remote Sensing* Vol. 53 (1), 102-121.

2016 Deng, Yingbin, and Changshan Wu*, Development of a Class-Based Multiple Endmember Spectral Mixture Analysis (C-MESMA) Approach for Analyzing Urban Environments. *Remote Sensing* 8, no. 4 (2016): 349.

2016 Long, Yuannan, Changshan Wu*, Changbo Jiang, Shixiong Hu, and Yizhuang Liu. "Simulating the Impacts of an Upstream Dam on Pollutant Transport: A Case Study on the Xiangjiang River, China." *Water* 8, no. 11 (2016): 516.

2015 Yingbin Deng, Changshan Wu*, Miao Li, Renrong Chen, RNDSI: A ratio normalized difference soil index for remote sensing of urban/suburban environments, *International Journal of Applied Earth Observation and Geoinformation*, 39, 40-48.

2015 Cheng Zhong, Cuizhen Wang* and Changshan Wu, MODIS-Based Fractional Crop Mapping in the U.S. Midwest with Spatially Constrained Phenological Mixture Analysis, *Remote Sensing*, 7 (1), 512-529.

2015 Wenliang Li and Changshan Wu*, Incorporating land use land cover probability information into endmember class selections for temporal mixture analysis, *ISPRS Journal of Photogrammetry and Remote Sensing*, 101,

163-173.

2015 Rama Mohapatra and Changshan Wu, Modeling Urban Growth at a Micro level: a Panel Data Analysis, *International Journal of Applied Geospatial Research*, 6, 36-52.

2015 Shanshan Li, Man Peng, Changshan Wu, Xuxiang Feng, Yeiwei Wu, Optimal selection of GCPs from Global Land Survey 2005 for precision geometric correction of Landsat-8 imagery, *European Journal of Remote Sensing*, 48, 303-318.

2015 Miao Li, Shuying Zang, Changshan Wu, Yingbin Deng, Segmentation-based and rule-based spectral mixture analysis for estimating urban imperviousness, *Advances in Space Research*, 55, 1307-1315.

2014 Changshan Wu, Chengbin Deng, and Xiuping Jia, Spatially-constrained multiple endmember spectral mixture analysis for quantifying sub-pixel urban impervious surfaces, *IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing*, 7, 1976-1984.

2014 Wenliang Li, Changshan Wu*, Shuying Zang, Modeling urban land use conversion of Daqing City, China: a comparative analysis of stochastic cellular automata and CLUE-S models, *Stochastic Environmental Research & Risk Assessment*, 28, 817-828.

2014 Greg Rybarcyzk and Changshan Wu, Examining the impact of urban morphology on bicycle mode choice, *Environment and Planning B*, 41 (2), 272-288.

2014 Wenliang Li and Changshan Wu*, Phenology-based temporal mixture analysis for estimating large-scale impervious surface distributions, *International Journal of Remote Sensing*, 35 (2), 779-795.

2014 Dehua Mao, Zongming Wang, Changshan Wu, Chunhua Zhang and Chunying Ren, Topsoil carbon stock dynamics in the Songnen Plain of Northeast China from 1980 to 2010, *Fresenius Environmental Bulletin*, 23 – No 2a.

2014 Haitao Zhao, Bing Zhang*, Changshan Wu, Zhengli Zuo, Zhengchao Chen, Jiantao Bi, Direct georeferencing of oblique and vertical imagery in different coordinate systems, *ISPRS Journal of Photogrammetric Engineering and Remote Sensing*, 95, 122-133.

2014 Miao Li, Shuying Zang, Bing Zhang, Shanshan Li, Changshan Wu*, A Review of Remote Sensing Image Classification Techniques: the Role of Spatio-contextual Information, *European Journal of Remote Sensing*, 47, 389-411.

2014 Miao Li, Shuying Zang*, Haifeng Xiao, and Changshan Wu, Speciation and distribution characteristics of heavy metals and pollution assessments in the sediments of Nashina Lake, Heilongjiang, China, *Ecotoxicology*, 23 (4), 681-688.

2014 Dehua Mao, Zongming Wang, Changshan Wu, Chunying Ren, Examining forest net primary productivity dynamics and climatic factors in Northeast China from 1982 to 2010, *Chinese Geographical Science*, 24 (6), 631-646.

2013 I-Hui Lin, Changshan Wu*, and Chris De Sousa, Examining the economic impact of park facilities on neighboring residential property values, *Applied Geography*, 45, 322-331.

2013 Chengbin Deng and Changshan Wu*, The use of single-date MODIS imagery for estimating large-scale urban impervious surface fraction with spectral mixture analysis and machine learning techniques, *ISPRS Journal of Photogrammetry and Remote Sensing*, 86, 100-110.

2013 Wenliang Li and Changshan Wu*, A spatially explicit method to examine the impact of urbanization on natural ecosystem service values, *Journal of Spatial Science*, 58, 275-289.

2013 Lianru Gao, Bing Zhang, Xu Sun, Shanshan Li, Qian Du, and Changshan Wu, Optimized maximum noise fraction for dimensionality reduction of Chinese HJ-1A hyperspectral data, *EURASIP Journal on Advances in Signal Processing*, 65, doi:10.1186/1687-6180-2013-65

2013 Chengbin Deng and Changshan Wu*, A spatially adaptive spectral mixture analysis method for mapping subpixel impervious surface distribution, *Remote Sensing of Environment*, 133, 62-70.

2013 Chengbin Deng and Changshan Wu*, Estimating very high resolution land surface temperature using a spectral unmixing and thermal mixing approach, *International Journal of Applied Earth Observation and Geoinformation*, 23, 155-164.

2013 Bing Zhang, Shanshan Li, Changshan Wu, Lianru Gao, Wenjuan Zhang, Man Peng, A neighbourhood-constrained k-means approach to classify very high spatial resolution hyperspectral imagery, *Remote Sensing Letters*, 4, 161-170.

2013 Chengbin Deng and Changshan Wu*, Improving Small-area Population Estimation: an Integrated Geographic and Demographic Approach, *Annals of the Association of American Geographers*, 103, 1123-1141.

2013 Chengbin Deng and Changshan Wu*, Examining the impacts of urban biophysical compositions on surface urban heat island: a spectral unmixing and thermal mixing approach, *Remote Sensing of Environment*, 131, 262-274.

2013 Haotao Zhao, Bing Zhang, Changshan Wu, Zengli Zuo, and Zhengchao Chen, Development of a Coordinate Transformation Method for Direct Georeferencing in Map Projection Frames, *ISPRS Journal of Photogrammetric Engineering and Remote Sensing*, 77, 94-103..

2012 Chengbin Deng and Changshan Wu*, BCI: a Biophysical Composition Index for Remote Sensing of Urban Environments, *Remote Sensing of Environment*, 127, 247-259.

2012 Changshan Wu, Handbook of Applied Spatial Analysis: Software Tools, Methods and Applications, *Journal of Regional Science*, 52 (2), 386-387.

2012 Changshan Wu and Rashi Sharma, Housing Submarket Classification: the Role of Spatial Contiguity, *Applied Geography*, 32 (2), 746-756.

2011 Shuying Zang, Changshan Wu, Xiaodong Na, Impact of Urbanization on Natural Ecosystem Service Values: a Comparative Study, *Environmental Monitoring and Assessment*, 179:575–588.

2011 Wanhui Yu, Shuying Zang, Changshan Wu, Wen Liu, Xiaodong Na, Analyzing and modeling land use land cover change (LUCC) in the Daqing city, China, *Applied Geography*, 31 (2), 600-608.

2010 Le Wang and Changshan Wu, Population estimation using remote sensing and GIS technologies, *International Journal of Remote Sensing*, 31 (21), 5569-5570.

2010 Jose L. Silvan-Cardenas, Le Wang, Peter Rogerson, Changshan Wu, Tiantian Feng, and Benjamin D. Kamphaus, Assessing fine spatial resolution remote sensing for small area population estimation，*International Journal of Remote Sensing*, 31, 5605-5634.

2010 Chengbing Deng, Changshan Wu*, and Le Wang, Improving Housing Unit Method for Small Area Population Estimation Using Remote Sensing and GIS Information, *International Journal of Remote Sensing*, 31, 5673- 5688.

2010 Rama P. Mohapatra and Changshan Wu, High Resolution Impervious Surface Estimation: an Integration of IKONOS and Landsat-7 ETM+ Imagery, *Photogrammetric Engineering and Remote Sensing*, 76 (12), 1329-1341.

2010 Greg Rybarczyk and Changshan Wu, Bicycle Facility Planning Using GIS and Multi-Criteria Decision Analysis, *Applied Geography*, 30 (2), 282-293.

2009 Changshan Wu, Quantifying high-resolution impervious surfaces using spectral mixture analysis, *International Journal of Remote Sensing*, 30 (11), 2915 – 2932.

2009 Chris De Sousa, Changshan Wu, and Lynne M. Westphal, Assessing the Effect of Publicly-Assisted Brownfields Redevelopment on Surrounding Property Values, *Economic Development Quarterly*, 23, 2, 95-110.

2008 Fei Yuan, Changshan Wu, and Marvin Bauer, Comparison of various spectral analysis techniques for impervious surface estimation using Landsat imagery, *Photogrammetric Engineering and Remote Sensing* 74 (8), 1045-1055.

2007 Danlin Yu, Dennis Wei, and Changshan Wu, Modeling spatial dimensions of housing prices in Milwaukee, *Environment and Planning B* 34(6) 1085 – 1102

2007 Changshan Wu and Fei Yuan, Seasonal sensitivity analysis of impervious surface estimation with satellite imagery, *Photogrammetric Engineering and Remote Sensing*, 73 (12), 1393-1402.

2007 Changshan Wu and Alan T. Murray, Population estimation using Landsat ETM+ imagery, *Geographical Analysis*, 39 (1): 26-43.

2006 Danlin Yu and Changshan Wu, Incorporating Remote Sensing Information in Modeling House Values: A Regression Tree Approach, *Photogrammetric Engineering and Remote Sensing*, 72, 2, 129-138.

2005 Changshan Wu and Alan T. Murray, A cokriging method for estimating population density in urban areas, *Computers, Environment, and Urban Systems*, 29, 558-579.

2005 Min Wu, Tian Zhao, and Changshan Wu, Public health data collection and sharing using HIPAA messages, *Journal of Medical Systems*, 29, 303-316.

2005 Changshan Wu and Alan T. Murray, Optimizing public transit quality and system access: the multiple route maximal covering/shortest path problem, *Environment and Planning B,* 32, 163-178.

2004 Danlin Yu and Changshan Wu, Understanding population segregation from Landsat ETM+ imagery: a geographically weighted regression approach, *GIScience and Remote Sensing*, 41 (3), 187-206.

2004 Changshan Wu, Normalized spectral mixture analysis for monitoring urban composition using ETM+ imagery, *Remote Sensing of Environment*, 93 (4), 480-492.

2003 Changshan Wu and Alan T. Murray, Estimating impervious surface distribution by spectral mixture analysis, *Remote Sensing of Environment*, 84, 493-505.

Book Chapters

2011 Changshan Wu and Fei Yuan, Remote Sensing of High-Resolution Urban Impervious Surfaces, Urban Remote Sensing: *Monitoring, Synthesis and Modelling in the Urban Environment, Edited by Xiaojun Yang.*

2007 Rama P. Mohapatra and Changshan Wu, 2007, Sub-pixel imperviousness estimation with IKONOS image: an artificial neural network approach, Chapter 2, pp21-38, in *Remote Sensing of Impervious Surfaces*, Edited by Qihao Weng, CRC Press, Taylor and Francis Group.

2007 Changshan Wu, 2007, Remote sensing applications in urban socio-economic analysis, in *Integration of GIS and Remote Sensing*, edited by Mesev, V., John Wiley & Sons Ltd, Chichester, England.

RESEARCH GRANTS

Research Grants Awarded

1. *Examining Uncertainties in Spectral Mixture Analysis of Remotely Sensed Imagery*, sponsored by University of Wisconsin Milwaukee Research Growth Initiative, University of Wisconsin-Milwaukee, $78,198.00, Funded. (July 2017 - June 2019).
2. *Estimating urban impervious surface distribution in Wisconsin using spatiotemporal analysis,* PI, University of Wisconsin-Milwaukee Graduate School, May 2014-June 2016, $15,000.
3. *Impacts of climatic and land use changes on streamflow and water quality in the Milwaukee River basin,* co-PI (PI: Choi, W), WI Groundwater Coordinating Council, United States Geological Survey, March 2013 – August 2015, $78,556.
4. *Urban impervious surface estimation using remote sensing techniques: a*

simulation approach, University of Wisconsin Milwaukee Research Growth Initiative, PI, July 2012 – December 2014, $66,344.

5. *Impact of green infrastructure on property values with the Milwaukee metropolitan sewage district planning area*, Milwaukee Metropolitan Sewage District (MMSD), senior personnel, February 2012 – May 2012, $38,840.
6. *Mapping Urban Impervious Surfaces using IKONOS Imagery: an Integrated Approach*, The Graduate School Research Committee Awards, University of Wisconsin-Milwaukee, PI, July 2009 – June 2010, $8,887.
7. *Collaborative research: improving small area population estimation with high resolution remote sensing*, National Science Foundation, PI, August 2008 – Jan 2012, $220,213.
8. *GIS analysis of the Milwaukee and Menomonee Rivers: pathogen concentrations and correlations*, Center for Urban Population Health, Co-PI, June 2008 – May 2009, (PI: Dr. Robert Burlage from School of Health, University of Wisconsin-Milwaukee), $21,049.
9. *A GIS approach to waterborne infectious disease: cryptosporidium*, Center for Urban Population Health, Co-PI, 5/21/07-5/25/08, (PI: Dr. Robert Burlage from School of Health, University of Wisconsin-Milwaukee), $30,334.
10. *Assessing the impact of brownfields redevelopment on Residential property values and real estate conditions*, US Forest Service, North Central Research Station, Co-PI, September 2005 – March 2007, (PI: Dr. Chris DeSousa from Department of Geography at UWM), $51,849
11. *Understanding Lyme Disease and Environmental Relationships in Wisconsin - A remote sensing and GIS approach*, The Graduate School Research Committee Awards, University of Wisconsin-Milwaukee, PI, September 2005 – June 2006, $14,527
12. *Impervious Surface estimation using IKONOS imagery*, Research Infrastructure Program, Wisconsin Space Grant Consortium, PI, June 2005 – June 2006, $4,000

CONFERENCE PRESENTATIONS

2019 Changshan Wu, Applications of VHR remote sensing imagery in urban environments, Annual Meeting of Association of American Geographers, Washington DC

2018 Changshan Wu, Spectral mixture analysis applications in urban environments: a review, Annual Meeting of Association of American Geographers, New Orleans, LA.

2017 Changshan Wu, Remote sensing of urban environments: a review, Annual Meeting of Association of American Geographers, Boston, MA.

2016 Wenliang Li and Changshan Wu, A spatial knowledge assisted approach for addressing endmember variability in spectral mixture analysis, Annual Meeting of Association of American Geographers, San Francisco, CA.

2016 Changshan Wu, Application of spectral mixture analysis in urban remote sensing: problems and potentials, Annual Meeting of American Association of Geographers, San Francisco, CA.

2015 Changshan Wu, Incorporating geographic information to remote sensing of urban analysis, Annual Meeting of American Association of Geographers, Chicago, Illinois.

2014 Changshan Wu, Incorporating Spatial-Contextual Information into Remote Sensing Image Classification, Annual Meeting of American Association of Geographers, Tampa, Florida

2014 Cheng Zhong*, Cuizhen Wang, Changshan Wu, Unmixing high temporal MODIS products for better documentation of bioenergy-driven land use change in the U.S. Midwest. Annual Meeting of American Association of Geographers, Tampa, Florida

2014 Wenliang Li and Changshan Wu, Incorporating land use and land cover probability information into endmember class selections for temporal mixture analysis, Annual Meeting of American Association of Geographers, Tampa, Florida

2013 Changshan Wu, Incorporating spatial information into spectral mixture analysis for mapping impervious surfaces, 21st Geoinformatics Conference, Kaifeng, Henan, China, June 20-22

2012 Changshan Wu, Change analysis of urban impervious surface areas at the watershed level, *Annual Meeting of American Association of Geographers*, New York City, New York, Feb 24-28

2012 Wenliang Li and Changshan Wu, Modeling urban land use conversion of Daqing City, China: a comparative analysis of stochastic cellular automata and CLUE-S models, *Annual Meeting of American Association of Geographers*, New York City, New York, Feb 24-28

2011 Changshan Wu, Long-term change analysis of urban impervious surface, *Annual Meeting of American Society of Photogrammetry & Remote Sensing* (ASPRS), May, 1-5

2011 Changshan Wu, Impact of Urbanization on Natural Ecosystem Service Values, *Annual Meeting of the Association of American Geographers*, Seattle, WA, April 14 – 18.

2011 Chengbin Deng and Changshan Wu, Improving Small-area Housing Unit and Population Estimation using Remote Sensing and GIS, Annual Meeting of American Society of Photogrammetry & Remote Sensing (ASPRS), May, 1-5.

2011 Chengbin Deng and Changshan Wu, Improving small-area housing unit and population estimation using remote sensing and GIS, Annual Meeting of the Association of American Geographers, Seattle, WA, April 14 – 18.

2009 Changshan Wu, GIS datasets for improving small area population estimation, Annual Meeting of the Association of American Geographers, Las Vegas, NV, March 22-27.

2007 Chris De Sousa and Changshan Wu, Assessing the impact of brownfields redevelopment on residential property values and real estate conditions,

Annual Meeting of the Association of American Geographers, San Francisco, CA, April 17-21

2006 Changshan Wu, Impervious Surface Estimation using IKONOS imagery, the 16th Annual Wisconsin Space Conference, Milwaukee, WI, August 10-11

2006 Changshan Wu and Fei Yuan, Seasonal sensitivity Analysis of Impervious Surface Estimation with Satellite Imagery, Annual Meeting of the Association of American Geographers, Chicago, Illinois, March 7-11.

2005 Fei Yuan and Changshan Wu, Estimating and Mapping Percent of Impervious Surface Area: A Comparison of Different Methods, The Minnesota GIS/LIS Consortium Annual Conference, Minneapolis, MN, October 3-5.

2005 Changshan Wu, Normalized Spectral Mixture Analysis for Monitoring Urban Composition Using ETM+ Imagery, Annual Meeting of the Association of American Geographers, Denver, Colorado, April 5-9.

2005 Changshan Wu and Danlin Yu, Understanding Population Segregation from Landsat ETM+ Imagery: A Geographically Weighted Regression Approach, Annual Meeting of American Society of Photogrammetry & Remote Sensing, March 7-11.

2004 Changshan Wu, Validating population estimation models from remote sensing, *Annual Conference of American Society for Photogrammetry & Remote Sensing*, May 24-29.

2004 Changshan Wu, Monitoring and modeling urban growth, *Annual Meeting of the Association of American Geographers,* Philadelphia, Pennsylvania, March 16-20.

2003 Changshan Wu and Alan T. Murray, Addressing Quality and Coverage in Transit System Management, *The 50th Annual North American Meetings of The Regional Science Association International*, Philadelphia, Pennsylvania November 20-22, 2003

2003 Alan T. Murray and Changsham Wu, Using GIS to Improve Transit Planning, *Ohio Transportation Engineering Conference (OTEC)*, November 5 – 6, 2003

2003 Changshan Wu and Alan T. Murray, A Cokriging method for estimating population density in urban areas, *Annual Meeting of the Association of American Geographers,* New Orleans, Louisiana

2002 Changshan Wu, Estimating population density with intelligent interpolation methods, *East Lakes Division Annual Meeting of the Association of American Geographers*, Mt. Pleasant, Michigan

2002 Changshan Wu and J. Raul Rameriz, Generation of a land cover map for Ohio, *Annual Meeting of North American Cartographic Information Society*, Columbus, Ohio

2002 Changshan Wu and Alan T. Murray, Estimating population distribution for transit planning using integrated GIS and RS technologies, *Annual Meeting of Association of American Geographers*, Los Angeles, CA

2001 Honglie Qiu, Changshan Wu, and Junping Zhong, Monitoring the "Basin-And-Range" Dessert Ecosystem in Xinjiang, Northwestern China, *Annual Meeting of Association of American Geographers*, New York City

Teaching experiences

Geog 110: The World: People and Regions
Geog 403: Remote Sensing: Environmental and Land Use Analysis
Geog 430: Transportation Geography
Geog 525: Geographic Information Science
Geog 547: Spatial Analysis
Geog 625: Intermediate Geographic Information Science
Geog 725: Adv GIS: Geographic Modeling
Geog 750: Geographic Techniques: Remote Sensing and Urban Analysis

Graduated students (10 Ph.ds and 5 Master's)

Wei Xu (Ph.d. 2019), "*Socio-spatial disparities in dementia mortality in the United States*", (currently post-doctoral researcher at University of Wisconsin-Madison)

Yingbin Deng (Ph.d. 2018), "*Uncertainty analysis of spectral mixture analysis of remote sensing imagery*", (currently assistant professor at Gangzhou Institute of Geography, China)

Yang Song (Ph.d. 2018), "*Examining human heat stress with remote sensing technologies*", (currently lecturer at the Ohio State University)

Haijian Liu (Ph.d. 2017), "*Ash tree identification based on the integration of hyperspectral imagery and high density LiDAR data*" (currently assistant professor at Hangzhou Normal University, China)

I-Hui Lin (Ph.d. 2016), "*Hedonic price model and spatial modeling for analyzing urban park system*" (currently data analyst of Institutional Research, Milwaukee Area Technical College)

Wenliang Li (Ph.d. 2016), "*Large-scale urban impervious surfaces estimation through incorporating temporal and spatial information into spectral mixture analysis*", (currently assistant professor, University of North Carolina Greensboro)

Chengbin Deng (Ph.d. 2013), "*Small-area population estimation: an integration of demographic and geographic techniques*" (currently assistant professor, Department of Geography, State University of New York – Binghamton).

Rama Mohapatra (Ph.d. 2011), "*Monitoring and Modeling Urban Growth Using Remote Sensing and GIS Technologies"* (currently associate professor, Department of Geography, Minnesota State University)

Greg Rybarczyk (Ph.d. 2010), "*Bicycle Travel Demand Forecasting Using Geographic Information Systems and Agent Based Modeling"*, (currently associate professor, Department of Geography, University of Michigan – Flint)

Rashi Sharma (Ph.d. 2009), "*Housing Submarkets: A Spatio-temporal Analysis"*, (Currently director of Trusanga Educational Services Pvt. Ltd.)

Patience Farmer (MS 2016), non-thesis track

Stephen W. Mauel (MS, 2008) "*GIS, GPS, and the USDA Soils Maps: Mapping the Jordan / Prairie Du Chien Contact in Southwestern Wisconsin*", (Currently GIS specialist, *Wisconsin Geological and Natural History Survey)*

Brandon Meleski, (MS, 2007): Non-thesis track

Qinhua Zhang (MA/MLIS, 2006): Non-thesis track

Greg Rybarczyk, (MS, 2005): "*Using GIS and a Multi-criteria Decision Analysis for Bicycle Facility Planning: a Case Study in Milwaukee, Wisconsin*".

Departmental Services at UWM

University tenure and promotion committee member
Vice chair
Graduate committee member, chair
Technical committee member
GIS council committee member, GIS certificate sub-committee member
GIS day planning committee

Professional Services

Vice Chair/Chair, Remote Sensing Specialty Group, Association of American Geographers, 2016-2019

Secretary / Treasurer, Remote Sensing Specialty Group, Association of American Geographers, 2014-2016

Chair of "Remote Sensing Image Classification With Spatial Contextual and Sub-pixel Information" Session, in 2014 Annual Meeting of AAG

Chair of "Acquisition and Processing of Remotely Sensed Data" sessions, in 2013 Geoinformatics Conference, Kaifeng, Henan, China, June 20-22.

Planning Committee of ASPRS annual conference in Milwaukee, WI (2011)

Guest editor for special issue "Population Estimation Using Remote Sensing and GIS Technologies" of *International Journal of Remote Sensing* (2010).

Chair of "Remote Sensing and GIS for Urban Analysis" session, in 2006 Annual Meeting of American Association of Geographers, Chicago, Illinois, March 7-11.

Organizer of Remote Sensing and GIS for Urban Analysis Session I, II, III, in 2004 Annual meeting of American Association of Geographers, Philadelphia, Pennsylvania, March 16-20.

Board of Director (2012 – Pres.), Grant Development Committee (2006 – 2007), Budget Committee (2005-2006) of Chinese Professionals in Geographic Information Systems. Participated the GO-NORTHEAST Lecture Series in Summer 2007

Professional Memberships

2004- Present International Association of Chinese Professionals in Geographic Information Sciences

2004 – Present American Society for Photogrammetry & Remote Sensing

2002 – Present Association of American Geographers

Honors and Awards

2006 UCGIS Intergraph Young Scholar Award, UCGIS

2003 E. Willard and Ruby S. Miller Fellowship Award, Department of Geography, Ohio State University

2002 Best Ph.D. student paper award, East Lakes Division Annual Meeting of the Association of American Geographers, Mt. Pleasant, Michigan