

# Xin (Shane) Miao, Ph.D

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## EDUCATION

- 08/2000 – 12/2005 Ph.D. (Double Degree), Ecosystem and Remote Sensing, ESPM department, University of California, Berkeley, USA
- 01/2003 – 05/2005 M.A. (Double Degree), Statistics, University of California, Berkeley, USA
- 08/1997 – 07/2000 M.S., Mapping & Geography Information System, Institute of Remote Sensing Applications, Chinese Academy of Sciences, Beijing, China
- 09/1992 – 07/1997 B.E., Precision Instruments and Measurement and Control Techniques, Tsinghua University, Beijing, China.

## PROFESSIONAL EXPERIENCE

- 08/2017-now *Professor*, Department of Geography, Geology & Planning, Missouri State University.
- 08/2011-07/2017 *Associate Professor*, Department of Geography, Geology & Planning, Missouri State University.
- 08/2011-08/2012 *Adjunct Professor*, Department of Geological Sciences, University of Texas at San Antonio (sabbatical).
- 08/2006-08/2011 *Assistant Professor*, Department of Geography, Geology & Planning, Missouri State University.
- 08/2005-06/2006 *Postdoctoral Fellow*, Department of Geography, University of Nevada at Reno.
- 09/2002-05/2005 *Research Assistant*, Center for Assessment & Monitoring of Forest & Environmental Resources (CAMFER), UC Berkeley.
- 09/2000-08/2002 *Research Assistant*, Environmental Science, Policy, and Management, UC Berkeley.

## TEACHING EXPERIENCE

- GRY 305 Geography of China, Fall, 2016.
- GRY 360 Interpretation of Aerial Photography, Fall, 2006-2016.
- GRY 551/GEO 551 Remote sensing, Fall, 2006-2016.
- GRY 552/GEO 572 Photogrammetry and LiDAR technology, Fall, 2006-2016.
- GEO 578 Digital Remote Sensing Image Processing, Fall, 2007-2016.
- GRY 100 World Regional Geography, Spring, 2015

GEO 655	Advanced Geospatial Applications: Environmental modeling with GIS & Remote Sensing, Fall, 2006
GEOG 311	Maps & Image Interpretation, UNR, Reno. Spring, 2006
ATDP 2530	Introduction to Computers, UC, Berkeley. Spring, 2005

## **PROFESSIONAL MEMBERSHIPS**

- Association of American Geographers (AAG)
- American Geophysical Union (AGU)
- American Society for Photogrammetry and Remote Sensing (ASPRS)
- Life-long membership of the International Association of Chinese Professionals in Geographic Information Sciences (CPGIS)

## **HONORS AND AWARDS**

2016	Recipient of the polar cyberinfrastructure RCN (Reserch Coordination Network) XSEDE 2016 hackathon, NSF sponsored. \$1,816.
2015	NSF EPSCoR Seed Project: UAS-based hyperspectral sensor and camera system. \$69,986.
2015	Summer Faculty Fellowship, ‘Data Mining of High Spatial Resolution Images for Arctic Sea Ice Physical Properties’, \$6,000.
2012	Sabbatical, ‘Applying tree-based ensemble classification algorithms for ecosystems’, one year in University of Texas at San Antonio as an Adjunct Professor.
2010	BancorpSouth Academic Spotlight, Missouri State University.
2009	Faculty Research Grant, Missouri State University, \$6900.
2009	Ecosystem Indicator Research Grant, Clark County, NV, \$111,597.
2009	Summer Faculty Fellowships \$6,000.
2008	Faculty Research Grant, Missouri State University, \$6290.
2008	Pillar of Learning Award, Missouri State University (Teaching Award).
2008	New Course Creation Award, Missouri State University (Teaching Award).
2006	Instructional Enhancement Grants (IEG), “Instructional Materials for Geographic Information Science Education”, University of Nevada, Reno.
2006	Geographic Information Science Education”, University of Nevada, Reno.
2005	The 3 <sup>rd</sup> place of the Student Honor Paper Competition from the Remote Sensing Specialty Group, the 101th AAG Annual Meeting, Denver, 2005.
2005	American Society for Photogrammetry and Remote Sensing (ASPRS) 2005 Student Travel Grants, Baltimore, MD, 2005.
2004	Travel award for the 100th AAG Annual Meeting, Philadelphia, 2004.

## **PUBLICATIONS (PEER REVIEWED)**

- [1] Xiaoyi Shen, Changqing Ke, **Xin Miao**, “An Object-Oriented Method for Automatic Detection of the Habitats of Emperor Penguin Colonies”, *IEEE Geoscience and Remote Sensing Letters*, submitted, 2016.
- [2] Thu Ngo, **Xin Miao**, Douglas N Robinson, Qiong-Qiong Zhou, “An RNA-binding protein, RNP-1, protects microtubules from nocodazole and localizes to the leading edge during cytokinesis and cell migration in Dictyostelium cells”, *Acta Pharmacologica Sinica* 2016: 1–9, 2016 (Contribute to digital image processing).

- [3] **Xin Miao**, Hongjie Xie, Stephen F. Ackley, Songfeng Zheng, "Object-Based Arctic Sea Ice Ridge Detection From High-Spatial-Resolution Imagery", *IEEE Geoscience and Remote Sensing Letters*, 13(6): 787-791, 2016.
- [4] **Xin Miao**, Hongjie Xie, Stephen F. Ackley, Donald K. Perovich, and Changqing Ke, "Object-Based Detection of Arctic Sea Ice and Melt Ponds Using High Spatial Resolution Aerial Photographs", *Cold Regions Science and Technology*, 119: 211-222, 2015.
- [5] Qiu, Xiaomin, Shuo-Sheng Wu, and **Xin Miao**. "Incorporating road and parcel data for object-based classification of detailed urban land covers from NAIP images." *GIScience & Remote Sensing*, 51(5): 498-520, 2014.
- [6] **Xin Miao**, Xiaomin Qiu, Shuo-Sheng Wu, Jun Luo, Douglas R. Gouzie, and Hongjie Xie, "Developing Efficient Procedures for Automated Sinkhole Extraction from Lidar DEMs", *Photogrammetric Engineering & Remote Sensing*, 79(6): 545-554, June, 2013.
- [7] **Xin Miao**, Jill S. Heaton, Songfeng Zheng, Hui Liu, "Applying Tree-based Ensemble Algorithms to Ecosystem Classification Using Multitemporal Multisource Remote Sensing Data", *International Journal of Remote Sensing*, 33(6):1823-1849, 2012.
- [8] **Xin Miao**, Jill S. Heaton, "Evaluating the Relative Importance of Spectral, Topographic, and Texture Features in the Ecosystem Classification", *GeoInformatics IEEE 2011*, p. 1-6.
- [9] **Miao, X.**, Rohit Patil, Jill S. Heaton, Richard C. Tracy, "Detection and Classification of Invasive Saltcedar through High Spatial Resolution Airborne Hyperspectral imagery ", *International Journal of Remote Sensing*, 32(8): 2131-2150, 2011.
- [10] **Xin Miao**, Jill S. Heaton, "A Comparison of Random Forest and Adaboost Tree in Ecosystem Classification in East Mojave Desert", *GeoInformatics IEEE 2010*, p. 1-6.
- [11] Jun Luo, Danlin Yu and **Xin Miao**, "Modeling Urban Growth Using GIS and Remote Sensing", *GIScience & Remote Sensing*, 2008, 45, No. 4, p. 426-442.
- [12] Pu, R., Gong, P., Tian, Y., **Miao, X.**, Carruthers, R., and Anderson, G.L., "Invasive Species Change Detection Using Artificial Neural Networks and CASI Hyperspectral Imagery", *Environmental Monitoring and Assessment*, 140: 15-32, 2008
- [13] Pu, R., Gong, P., Tian, Y., **Miao, X.**, Carruthers, R., and Anderson, G.L., "Using CASI Hyperspectral Data to Monitor Invasive Species: A Case Study of Saltcedar in Nevada, USA", *International Journal of Remote Sensing*, 29 (14): 3987-4011 , 2008
- [14] **Miao, X.**, Gong, P., Anderson, G.L. and Carruthers, R.I., "Applying Class-based feature extraction approaches for supervised classification of hyperspectral imagery", *Canadian Journal of Remote Sensing*, 33 (3): 162-175 JUN 2007.
- [15] **Miao, X.**, Gong, P., Swope, S., Pu, R. and Carruthers, R., Anderson, G., Heaton, J. and Tracy, C.R., "Estimation of yellow starthistle abundance through CASI-2 hyperspectral imagery using linear spectral mixture models", *Remote Sensing of Environment*, 101:329-341, 2006.

- [16] **Miao, X.**, Gong, P., Swope, S., Pu, R. and Carruthers, R., "Detection of Yellow Starthistle through Band Selection and Feature Extraction from Hyperspectral Imagery", *Photogrammetric Engineering & Remote Sensing*, 73 (9): 1005-1015 SEP 2007.
- [17] P. Gong, **Xin Miao**, Ken Tate, Charles Battaglia, and Gregory S. Biging, "Water Table Level in Relation to EO-1 ALI and ETM+ Data over a Mountainous Meadow in California", *Canadian Journal of Remote Sensing*, 30(5):691-696, 2004.
- [18] **Xin Miao**, "The Computer Interface for Portable Field Instruments", *Microcomputer Applications*, in Chinese, 21(4):219-222, 2000.

## **TECHNIQUE REPORTS, CONFERENCE PAPERS AND PRESENTATIONS**

- [1] **Xin Miao**, et al., "Sea Ice Imagery Classification with Machine Learning and High-Performance Computing", XSEDE 2016 Polar Compute Hackathon, Miami, FL, July 17-19.
- [2] **Xin Miao**, "Drone-based Remote Sensing Research", The Summer CNAS Interdisciplinary Research Workshops, June 29, 2016.
- [3] **Xin Miao**, Hongjie Xie, "C41D-0732: Object-Based Arctic Sea Ice Feature Extraction through High Spatial Resolution Aerial photos", AGU 2015, San Francisco, CA, Dec. 14-18.
- [4] **Xin Miao**, Hongjie Xie, "Object-based Image Classification of Arctic Sea Ice and Melt Ponds through Aerial Photos", AAG ANNUAL MEETING, Tampa, FL, April 8-12, 2014.
- [5] **Xin Miao**, Hongjie Xie, "C21C-0353: Object-Based Aerial Photos Analysis for Arctic Sea Ice Melt Ponds and Pressure Ridges", AGU 2014, San Francisco, CA, Dec. 17.
- [6] **Xin Miao**, "Detection of Sea Ice and Melt Ponds in the Arctic Ocean", Geography Awareness Week Events and GIS Day, November 22, 2013.
- [7] **Xin Miao**, Hongjie Xie, Zhijun Li, Ruibo Lei, "Detection of Sea Ice/ Melt Pond from Aerial Photos through Object-based Image Classification Scheme", NEMC(National Environmental Monitoring Conference) 2013, August 5-9, San Antonio, TX, 2013.
- [8] **Xin Miao**, Hongjie Xie, "Hierarchical Ensemble Classification Strategy for Multi-temporal Multi-source Data", AAG ANNUAL MEETING, LA, CA, 2013.
- [9] Ana Atilano, Geology, Mentor: **Xin Miao**, "Detection of Melt Ponds through High Spatial Resolution Aerial Photos", 2013 MORESE, University of Texas at San Antonio.
- [10] Ana Balino, Geology, Mentor: **Xin Miao**, "Extract Detailed Terrain Information From High-resolution Lidar Data", 2013 MORESE, University of Texas at San Antonio.
- [11] **Xin Miao**, "Automated Sinkhole Extraction from LiDAR DEMs", Remote Sensing Lab, University of Texas at San Antonio, 2012.
- [12] **Xin Miao**, "Robust Procedures for Automated Sinkhole Extraction from LiDAR DEMs", AAG ANNUAL MEETING, New York, New York, 2012.

- [13] **Xin Miao**, invited presentation, “Ecosystem Classification through ensemble classification”, in Beijing Normal University, and Beijing Forestry University, 2011.
- [14] **Xin Miao**, ‘Evaluating the Relative Importance of Spectral, Topographic, and Texture Features in the Ecosystem Classification’, Geoinformatics 2011 International Conference, Shanghai, China, June 24-26, 2011.
- [15] **Xin Miao**, Jill S. Heaton, "Ecosystem Classification Using Multi-source Remote Sensing Data Through AdaBoost Tree Algorithm", AAG ANNUAL MEETING, Seattle, Washington, 2011.
- [16] **Xin Miao**, Jill S. Heaton, “Final Vegetation Pilot GIS Data Technical Report”, Ecosystem Indicators Project #2005\_UNR\_578, Deliverable D22, 2011.
- [17] **Xin Miao**, Jill S. Heaton, “Final Vegetation GIS Data Delivery Final Report”, Ecosystem Indicators Project #2005\_UNR\_578-P, Deliverable D21, 2010.
- [18] **Xin Miao**, Jill S. Heaton, “Interim Vegetation GIS Data Delivery Technical Report”, Ecosystem Indicators Project #2005\_UNR\_578-P, Deliverable D18, 2010.
- [19] **Xin Miao**, Jill S. Heaton, "A Comparison of Adaboost and Bagging Trees in Classification of Ecosystems in Clark County Nevada ", AAG ANNUAL MEETING, Washinton, DC, 2010.
- [20] Kevin R. Evans, James F. Miller and **Xin Miao**, "Origins of the 38th parallel structures", GSA NC and SC joint meeting 2010, Branson, Missouri.
- [21] **Xin Miao**, “A Comparison of Neural Networks and Support Vector Machines to Detect Invasive Plants Saltcedar Using Hyperspectral Remote Sensing Imagery”, AAG ANNUAL MEETING, Las Vegas, NV, 2009.
- [22] Melida Gutierrez and **Xin Miao**, "Concentrations of Cu, Ba and as In Sediments and Their Association with the Presence of Mines In Northeast Chihuahua", GSA Joint Meeting, Houston, Texas, 2008.
- [23] **Xin Miao**, “Change Detection and Water Budget Modelling in the Middle Rio Conchos Basin in Mexico using Multi-time TM/ETM+ images”, AAG ANNUAL MEETING, Boston, MA, 2008.
- [24] Lucas Rengstorf, Xin Miao, "Classifying Different Types of Impervious Surfaces in an Urbanizing Community", AAG ANNUAL MEETING, Boston, MA, 2008.
- [25] Kevin R. Evans, George H. Davis, **Xin Miao**, Kevin L. Mickus, James F., Miller1, and Jared R. Morrow, "Re-evaluating the 38th Parallel Serial Impact Hypothesis", AGU Meeting, Fall, 2008.
- [26] **Xin Miao**, Melida Gutierrez, Elias Johnson, “Land Use and Land Cover Change Detection in the Rio Conchos Basin in Mexico using Multi-year TM images”, AAG ANNUAL MEETING, San Francisco, CA, 2007
- [27] **Xin Miao**, Jill S. Heaton, “Classification and Change Detection of Salt Cedar through CASI-2 hyperspectral imagery in Lovelock, Nevada”, ASPRS Annual Conference, Reno, NV. 2006

- [28] Rohit Patil, **Xin Miao**, Jill S. Heaton, Richard C. Tracy, “Detection and Classification of plant species through SpecTIR airborne hyperspectral imagery in Clark County, Nevada”, ASPRS Annual Conference, Reno, NV. 2006
- [29] **Xin Miao**, Rohit Patil, Jill S. Heaton, Richard C. Tracy, “Classification of Saltcedar and Honey Mesquite through SpecTIR Hyperspectral imagery in Clark County, Nevada”, AAG ANNUAL MEETING, Chicago, IL, 2006.
- [30] **Xin Miao**, “Estimation of Yellow Starthistle Cover through CASI-2 Hyperspectral Imagery Using Linear Spectral Mixture Models”, the 101th AAG Annual Meeting, Denver, 2005.
- [31] **Xin Miao**, “Applying False Color Composite Visualization Techniques through CASI-2 Hyperspectral Imagery for Detecting Yellow Starthistle”, ASPRS 2005 Annual Conference, Baltimore, MD, 2005.
- [32] **Xin Miao**, “Class-based Feature Extraction Approaches for Hyperspectral Images Classification”, The 100th AAG Annual Meeting, Philadelphia, 2004.

## **SERVICES AND ACTIVITIES**

- Associate Editor of “ISPRS Journal of Photogrammetry and Remote Sensing (5-year Impact Factor: 5.062)”, 2014-now.
- Member of Editorial Advisory Board (EAB) of the ISPRS Journal of Photogrammetry and Remote Sensing, 2013.
- Program Committee Member of EORSA (International Workshop on Earth Observation and Remote Sensing Applications), 2012, 2014 and 2016.
- Director of ASPRS (American Society for Photogrammetry and Remote Sensing) Heartland Region Office (previous Central Region), 2012-now.
- CPGIS (Chinese Professionals Geographic Information Systems) Newsletter Editor 2008-2013.
- Supervisor of ASPRS Student Chapter in Missouri State University, 2006-now.
- Reviewer of Journal Papers for
  - *Remote Sensing of Environment*,
  - *ISPRS Journal of Photogrammetry and Remote Sensing*,
  - *IEEE Transactions on Geoscience and Remote Sensing*,
  - *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*,
  - *Photogrammetric Engineering & Remote Sensing*
  - *Journal of Hydrology*
  - *Journal of Applied Remote Sensing*
  - *International Journal of Remote Sensing (IJRS)*,
  - *Canadian Journal of Remote Sensing*,
  - *International Journal of Digital Earth*,
  - *Computers and Electronics in Agriculture*,
  - *Environmental Management*,
  - *Precision Agriculture*,

- *Sensors.*
- MSU Faculty Senate 2014-now; MSU Faculty Grant Committee, 2014; Search Committee for Department Head, 2014; Department Teaching Technology Committee, 2008-now.
- Geography Awareness Week Events
  - 2013- November 22, “Detection of Sea Ice and Melt Ponds in the Arctic Ocean”, **Xin Miao**, 3:00, Libr 101.
  - 2014- November 15, organize and invite Dr. Jim Perterson to give a presentation “The D-Word: Drones and Geospatial Science”.
  - 2015- November 18, organize and invite Dr. Wasit Wulamu to give a presentation “A social and environmental synthesis for urban sustainability: watching St. Louis from space for the last 40 years”.
- Propose and build an “Augmented Reality (AR) Sandbox” with a Kinect sensor (based on UC Davis NSF-funded project), illustrate modern geospatial techniques, and demonstrate in **GIS Day 2015**.
- Chinese Calligraphy Demonstration in Music and Art Session in MSU Chinese New Year Celebration Week, 2013-2015.

### **SUBMITTED PROPOSALS**

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| 2016 | Faculty Research Grant, “Develop a low-cost wearable virtual reality platform for drone-based 3D canopy reconstruction”, Missouri State University, \$6270 ( <b>Funded</b> ).               |
| 2016 | Recipient of the polar cyberinfrastructure RCN (Reserch Coordination Network) XSEDE 2016 hackathon. \$1,816 ( <b>Funded</b> ).  |
| 2015 | NSF EPSCoR Seed Project: UAS-based hyperspectral sensor and camera system. \$69,986 ( <b>Funded</b> ).  |
| 2015 | Summer Faculty Fellowship, “Data Mining of High Spatial Resolution Images for Arctic Sea Ice Physical Properties”, \$6,000 ( <b>Funded</b> ).   |
| 2015 | NSF-PLR, “Collaborative Research: Developing On-Demand Service Module for Mining Geophysical Properties of Sea Ice from High Spatial Resolution Imagery”, \$126,977.00, ( <b>Pending</b> ). |
| 2015 | NSF_PLR, “Collaborative Research: Parameter tuning and validation of sea ice model for the Southern Ocean using remotely sensed ice thickness and snow depth”, \$109,737.00, (Not funded).  |
| 2015 | NSF-SMA, “IBSS: Advancing Risk and Vulnerability Assessment for Sinkhole Hazard”, \$331,840.00 (Not funded).  |
| 2014 | NSF-PLR, “Collaborative Research: Developing On-Demand Data Services for Discrete High Spatial Resolution Arctic Sea Ice Imagery”, \$142,300.00 (Not funded).                               |
| 2013 | NASA, “Rising lake level/water mass over Tibetan Plateau: An indication of glacier melting and/or increased P-E difference”, \$84,712 (Not funded).   |

- 2013 NASA, "Validation and improvement of sea ice model for the Southern Ocean using remote sensing data sets of ice thickness and snow depth", \$37,318 (Not funded).
- 2013 ONR, "Data mining of declassified image library for spatial-temporal analysis of sea ice physical properties", \$113,414 (Not funded).
- 2013 NSF-PLR, "Developing On-Demand Data Services for Discrete High Spatial Resolution Arctic Sea Ice Imagery", \$142,299 (Not funded).
- 2012 NSF-CMMI, "MRI: Acquisition of an Immersive Virtual Environment System to Support Research in the Built Environment", \$595,650.00 (Not funded).
- 2010 NSF-CMMI, "MRI: Acquisition of an Immersive Virtual Environment System to Support Research in the Built Environment", \$964,329.00 (Not funded).
- Spring 2010 NSF-CMG, "Developing Novel Machine Learning Algorithms for Advanced Satellite Image Interpretation to Evaluate Ecosystem Sustainability", leading PI, around \$130,600 (Returned, not fall within the domain of the Geosciences).
- Fall 2009 Faculty Research Grant, Missouri State University, \$6900 (**Funded**).
- Fall 2009 Grant VI with the ASDP (Asian Studies Development Program), EAST-WEST Center, Hawaii to complete Chinese studies major at MSU (Not funded).
- Fall 2009 MoDOT, "RFP: Light Detection and Ranging (LiDAR) Technology Evaluation", \$100,000 (Not funded).
- Summer 2009 NSF-MRI-R2, "Acquisition Of An Immersive Virtual Environment System", \$623,000 (Not funded).
- Spring 2009 NSF-OISE, "Integrating geochemical, geophysical and remote sensing analyses towards developing a basin management plan for the middle Rio Conchos (Mexico)", \$149,755 (Not funded in the 2nd round).
- Summer 2008 Summer Faculty Fellowships \$6,000 (**Funded**).
- Spring 2008 Curricular Innovation in GRY 552 Photogrammetry: Supplemented with Spatial Statistics, \$ 3,269 (Returned without review, funding cancelled).
- Spring 2008 University of Nevada at Reno/ Clark County, NV, "Ecosystem Indicator Project", \$111,597 (**Funded**).
- Fall 2006 USGS, "Enhancing Vector-Borne Disease Analyses in Sante Fe, New Mexico through Remote-Sensing and Geographic Information System Technologies", \$85,947 (Returned due to unacceptable format).
- Fall 2006 Faculty Research Grant, Missouri State University, \$6290 (**Funded**).