TAO LIU

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EDUCATION

PhD   University of Florida, Geomatics   August 2018
Dissertation: "Multi-Angle Analysis of UAV Images Using Statistical Model,
Photogrammetry & Machine Learning"
Committee: Amr Abd-Elrahman (chair)

MS   University of Florida, Statistics   August 2018

MS   ESF State University of New York, RS and GIS Engineering   May 2014
Thesis: "Using LiDAR point data for Individual Tree Crown Delineation"
Advisor: Jungho Im

BS   Northwest A&F University, Forestry   May 2011

HONORS AND AWARDS

USDA McIntire-Stennis   2020
This is a three-year grant focusing on using deep learning and remote sensing techniques to
develop individual tree crown delineation method.

University of Florida Outstanding Geomatics Doctoral Student   2014

University of Florida Graduate Fellowship   2014

APPOINTMENTS

Assistant Professor   2020-present
Michigan Technological University

Postdoc Research Associate   2018 to 2020
Oak Ridge National Laboratory

TEACHING EXPERIENCE

Michigan Technological University, Houghton   Aug 2020 to Dec 2020
Assistant Professor, College of Forest Resources and Environmental Science
- FW 4540 & 5540, Remote Sensing of Environment Lectures and Labs

Books

Liu, T., & Abd-Elrahman, A. (2019). Multi-View, Deep Learning, and Contextual Analysis: Promising Approaches for sUAS Land Cover Classification. Applications of Small Unmanned Aircraft Systems: Best Practices and Case Studies, 133.

Journal Publications

Shao, Z., Cai, J., Fu, P., Hu, L. and **Liu, T.,** 2019. Deep learning-based fusion of Landsat-8 and Sentinel-2 images for a harmonized surface reflectance product. *Remote Sensing of Environment*, 235, p.111425.

Nishan, B., and **Liu, T.**. "LandMOD ET mapper: A new matlab-based graphical user interface (GUI) for automated implementation of SEBAL and METRIC models in thermal imagery." *Environmental Modelling & Software* 118 (2019): 76-82.

Liu, T., Abd-Elrahman, A., Dewitt, B., Smith, S., Morton, J. and Wilhelm, V.L., 2019. Evaluating the potential of multi-view data extraction from small Unmanned Aerial Systems (UASs) for object-based classification for Wetland land covers. *GIScience & Remote Sensing*, 56(1), pp.130-159.

Liu, T., Abd-Elrahman, A., Zare, A., Dewitt, B.A., Flory, L. and Smith, S.E., 2018. A fully learnable context-driven object-based model for mapping land cover using multi-view data from unmanned aircraft systems. *Remote sensing of environment*, 216, pp.328-344.

Liu, T. and Abd-Elrahman, A., 2018. Multi-view object-based classification of wetland land covers using unmanned aircraft system images. *Remote Sensing of Environment*, 216, pp.122-138.

Liu, T. and Abd-Elrahman, A., 2018. Deep convolutional neural network training enrichment using multi-view object-based analysis of Unmanned Aerial systems imagery for wetlands classification. *ISPRS Journal of Photogrammetry and Remote Sensing*, 139, pp.154-170.

Liu, T., Abd-Elrahman, A., Morton, J. and Wilhelm, V.L., 2018. Comparing fully convolutional networks, random forest, support vector machine, and patch-based deep convolutional neural networks for object-based wetland mapping using images from small unmanned aircraft system. *GIScience & remote sensing*, 55(2), pp.243-264.

Liu, T. and Abd-Elrahman, A., 2018. An object-based image analysis method for enhancing classification of land covers using fully convolutional networks and multi-view images of small unmanned aerial system. *Remote Sensing*, 10(3), p.457.

Pande-Chhetri, R., Abd-Elrahman, A., **Liu, T.**, Morton, J. and Wilhelm, V.L., 2017. Object-based classification of wetland vegetation using very high-resolution unmanned air system imagery. *European Journal of Remote Sensing*, 50(1), pp.564-576.

Liu, T., Im, J. and Quackenbush, L.J., 2015. A novel transferable individual tree crown delineation model based on Fishing Net Dragging and boundary classification. *ISPRS Journal of Photogrammetry and Remote Sensing*, 110, pp.34-47.

Li, M., Im, J., Quackenbush, L.J. and Liu, T., 2014. Forest biomass and carbon stock quantification using airborne LiDAR data: A case study over Huntington Wildlife Forest in the Adirondack Park. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 7(7), pp.3143-3156.

Journal Papers in Review

Liu, T., Yang, L., and Lunga, D.D., "Change Detection Using Deep Learning Approach with Object-based Image Analysis," Submitted to: Remote Sensing of Environment, under minor revision.

Conference Papers

Peer-Reviewed

Liu, T., Yang, L. and Lunga, D.D., 2019, November. Towards misregistration-tolerant change detection using deep learning techniques with object-based image analysis. In *Proceedings of the 27th ACM SIGSPATIAL international conference on advances in geographic information systems* (pp. 420-423).

Liu, T., Yang, L., "A Fully Automatic Method for Rapidly Mapping Impacted Area by Nature Disaster", In *Proceedings of 2020 IEEE International Geoscience and Remote Sensing Symposium* (IGARSS), Accepted

Liu, T., Lunga, D., "Automatically Generating High Quality Training Samples from OpenStreetMap (OSM) Dataset for Road Network Mapping", In *Proceedings of 2020 IEEE International Geoscience and Remote Sensing Symposium* (IGARSS), Accepted

PRESENTATIONS AND INVITED LECTURES

Paper Presentation

"A Fully Automatic Method for Rapidly Mapping Impacted Area by Nature Disaster", IGARSS, Virtual conference, 2020

"Automatically Generating High Quality Training Samples from OpenStreetMap (OSM) Dataset for Road Network Mapping", Virtual conference, 2020

"Emerging Image Analysis Methods for UAV Images", Virtual Conference, ASPRS, 2020

"A fully learnable Context-Drive Object-Based Model for Mapping Landcovers", ASPRS, Denver, CO, US, 2018.

"Individual tree crown delineation using LiDAR point data and DSM", ASPRS, 2013, Baltimore, MD, US

Workshop
 "Object-based analysis of very high resolution images for natural land cover classification", ASPRS, 2018, *Denver, CO, US*

"Object-based analysis of very high resolution images for natural land cover classification", ASPRS, 2017, *Baltimore, MD, US.*

PROFESSIONAL SERVICE

Session chair
Chair of Session, "GeoAI and Deep Learning Symposium: Deep Learning for Landcover Mapping and Object Detection using Remote Sensing Imagery I" and "GeoAI and Deep Learning Symposium: Deep Learning for Landcover Mapping and Object Detection using Remote Sensing Imagery II", AAG, DC, US, 2019

Chair of Session, "Deep learning for Remote Sensing Applications", AAG, New Orleans, LA, US 2019

Editorial service
Guest editor, special issue "Geographic Object-Based Image Analysis: State-Of-the-Art and Emerging Research Trends", ISPRS International Journal of Geo-Information, 2019-2020

Peer-Reviewed Articles for:
- Drones
- Sensor
- Entropy
- Remote Sensing
- Biosystems Engineering
- ACM Sigspatial Conference
- Advances in Space Research
- GIScience & Remote Sensing
- European Journal of Agronomy
- Remote Sensing of Environment
- Aerospace Science and Technology
- European Journal of Remote Sensing
- Computers Environment and Urban Systems
- ISPRS International Journal of Geo-Information
- ISPRS Journal of Photogrammetry and Remote Sensing