

# Stanford

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## Zhuo Zheng

Postdoctoral Scholar, Computer Science

### Bio

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#### BIO

My research interests are Earth Vision and AI4Earth, especially multi-modal and multi-temporal remote sensing image analysis and their real-world applications.

First-author representative works:

- Our Change family: ChangeStar (single-temporal learning, ICCV 2021), ChangeMask (many-to-many architecture, ISPRS P&RS 2022), ChangeOS (one-to-many architecture, RSE 2021), Changen (generative change modeling, ICCV 2023)
- Geospatial object segmentation: FarSeg (CVPR 2020) and FarSeg++ (TPAMI 2023), LoveDA dataset (NeurIPS Datasets and Benchmark 2021)
- Missing-modality all weather mapping: Deep Multisensory Learning (first work on this topic, ISPRS P&RS 2021)
- Hyperspectral image classification: FPGA (first fully end-to-end patch-free method for HSI, TGRS 2020)

#### STANFORD ADVISORS

- Stefano Ermon, Postdoctoral Faculty Sponsor

#### LINKS

- Homepage: <https://zhuozheng.top/>

### Publications

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#### PUBLICATIONS

- **Single-Temporal Supervised Learning for Universal Remote Sensing Change Detection** *INTERNATIONAL JOURNAL OF COMPUTER VISION*  
Zheng, Z., Zhong, Y., Ma, A., Zhang, L.  
2024
- **FarSeg++: Foreground-Aware Relation Network for Geospatial Object Segmentation in High Spatial Resolution Remote Sensing Imagery.** *IEEE transactions on pattern analysis and machine intelligence*  
Zheng, Z., Zhong, Y., Wang, J., Ma, A., Zhang, L.  
2023; PP
- **Scalable Multi-Temporal Remote Sensing Change Data Generation via Simulating Stochastic Change Process**  
Zheng, Z., Tian, S., Ma, A., Zhang, L., Zhong, Y., IEEE  
IEEE COMPUTER SOC.2023: 21761-21770
- **ChangeMask: Deep multi-task encoder-transformer-decoder architecture for semantic change detection** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
Zheng, Z., Zhong, Y., Tian, S., Ma, A., Zhang, L.

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- **Building damage assessment for rapid disaster response with a deep object-based semantic change detection framework: From natural disasters to man-made disasters** *REMOTE SENSING OF ENVIRONMENT*  
Zheng, Z., Zhong, Y., Wang, J., Ma, A., Zhang, L.  
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- **Deep multisensor learning for missing-modality all-weather mapping** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
Zheng, Z., Ma, A., Zhang, L., Zhong, Y.  
2021; 174: 254-264
- **Change is Everywhere: Single-Temporal Supervised Object Change Detection in Remote Sensing Imagery**  
Zheng, Z., Ma, A., Zhang, L., Zhong, Y., IEEE  
IEEE.2021: 15173-15182
- **FPGA: Fast Patch-Free Global Learning Framework for Fully End-to-End Hyperspectral Image Classification** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Zheng, Z., Zhong, Y., Ma, A., Zhang, L.  
2020; 58 (8): 5612-5626
- **HyNet: Hyper-scale object detection network framework for multiple spatial resolution remote sensing imagery** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
Zheng, Z., Zhong, Y., Ma, A., Han, X., Zhao, J., Liu, Y., Zhang, L.  
2020; 166: 1-14
- **Foreground-Aware Relation Network for Geospatial Object Segmentation in High Spatial Resolution Remote Sensing Imagery**  
Zheng, Z., Zhong, Y., Wang, J., Ma, A., IEEE  
IEEE.2020: 4095-4104
- **Global road extraction using a pseudo-label guided framework: from benchmark dataset to cross-region semi-supervised learning** *GEO-SPATIAL INFORMATION SCIENCE*  
Lu, X., Zhong, Y., Zheng, Z., Wang, J., Chen, D., Su, Y.  
2024
- **EarthVQANet: Multi-task visual question answering for remote sensing image understanding** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
Wang, J., Ma, A., Chen, Z., Zheng, Z., Wan, Y., Zhang, L., Zhong, Y.  
2024; 212: 422-439
- **LoveNAS: Towards multi-scene land-cover mapping via hierarchical searching adaptive network** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
Wang, J., Zhong, Y., Ma, A., Zheng, Z., Wan, Y., Zhang, L.  
2024; 209: 265-278
- **Temporal-agnostic change region proposal for semantic change detection** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
Tian, S., Tan, X., Ma, A., Zheng, Z., Zhang, L., Zhong, Y.  
2023; 204: 306-320
- **Explicable Fine-Grained Aircraft Recognition Via Deep Part Parsing Prior Framework for High-Resolution Remote Sensing Imagery.** *IEEE transactions on cybernetics*  
Chen, D., Zhong, Y., Ma, A., Zheng, Z., Zhang, L.  
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- **Large-scale agricultural greenhouse extraction for remote sensing imagery based on layout attention network: A case study of China** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
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- **Large-scale deep learning based binary and semantic change detection in ultra high resolution remote sensing imagery: From benchmark datasets to urban application** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
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- **Cross-sensor domain adaptation for high spatial resolution urban land-cover mapping: From airborne to spaceborne imagery** *REMOTE SENSING OF ENVIRONMENT*  
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- **GRE AND BEYOND: A GLOBAL ROAD EXTRACTION DATASET**  
Lu, X., Zhong, Y., Zheng, Z., Chen, D., IEEE  
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- **Cascaded Multi-Task Road Extraction Network for Road Surface, Centerline, and Edge Extraction** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Lu, X., Zhong, Y., Zheng, Z., Chen, D., Su, Y., Ma, A., Zhang, L.  
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- **A Supervised Progressive Growing Generative Adversarial Network for Remote Sensing Image Scene Classification** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Ma, A., Yu, N., Zheng, Z., Zhong, Y., Zhang, L.  
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- **National-scale greenhouse mapping for high spatial resolution remote sensing imagery using a dense object dual-task deep learning framework: A case study of China** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
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- **Cross-domain road detection based on global-local adversarial learning framework from very high resolution satellite imagery** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
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- **FactSeg: Foreground Activation-Driven Small Object Semantic Segmentation in Large-Scale Remote Sensing Imagery** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
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- **Urban road mapping based on an end-to-end road vectorization mapping network framework** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
Chen, D., Zhong, Y., Zheng, Z., Ma, A., Lu, X.  
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- **A Spectral-Spatial-Dependent Global Learning Framework for Insufficient and Imbalanced Hyperspectral Image Classification** *IEEE TRANSACTIONS ON CYBERNETICS*  
Zhu, Q., Deng, W., Zheng, Z., Zhong, Y., Guan, Q., Lin, W., Zhang, L., Li, D.  
2022; 52 (11): 11709-11723
- **GAMSNet: Globally aware road detection network with multi-scale residual learning** *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*  
Lu, X., Zhong, Y., Zheng, Z., Zhang, L.  
2021; 175: 340-352
- **RSNet: The Search for Remote Sensing Deep Neural Networks in Recognition Tasks** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Wang, J., Zhong, Y., Zheng, Z., Ma, A., Zhang, L.  
2021; 59 (3): 2520-2534
- **COLOR: Cycling, Offline Learning, and Online Representation Framework for Airport and Airplane Detection Using GF-2 Satellite Images** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Zhong, Y., Zheng, Z., Ma, A., Lu, X., Zhang, L.  
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- **Edge-Reinforced Convolutional Neural Network for Road Detection in Very-High-Resolution Remote Sensing Imagery** *PHOTOGRAMMETRIC ENGINEERING AND REMOTE SENSING*  
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- **POP-NET: ENCODER-DUAL DECODER FOR SEMANTIC SEGMENTATION AND SINGLE-VIEW HEIGHT ESTIMATION**  
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- **COLOR: CYCLING OFFLINE LEARNING AND ONLINE REPRESENTING FOR REMOTE SENSING DATAFLOW**  
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- **Multi-channel Pose-aware Convolution Neural Networks for Multi-view Facial Expression Recognition**  
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