Yiquan Xu

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Education

Wuhan University Sept. 2022 – Sept. 2025

Master in Photogrammetry and Remote Sensing *Hubei, China*

- **Supervisor:** Prof. Liangpei Zhang and Associate Prof. Xin Su
- **Academic Performance:** Weighted Average: 90.07/100
- **Major Course:** Theory and Methods of Measurement Data Processing(96/100)
- **Research interests:**
  - Computer Vision and Deep Learning
  - Image Generation with Diffusion Models
  - Multi-temporal and Multi-sensor Remote Sensing Image Change Detection

Wuhan University Sept. 2018 – Jun. 2022

B.Eng. in Geodesy and Geomatics *Hubei, China*

- **Minor:** Law
- **Academic Performance:** Weighted Average: 90.18/100, GPA: 3.83/4.00(6%)
- **Major Course:** Probability Theory and Mathematical Statistics(99/100), Advanced Math(95/100)

Publications

Diffpurifier: An Optical and SAR Image Change Detection Method Based on Diffusion Purification

- Journal: **IEEE Transactions on Geoscience and Remote Sensing (TGRS) (JCR Q1, IF=8.6)**
- Authors: **Yiquan Xu(first author)**, Xin Su, Liangpei Zhang
- Publication date: June 2025
- Full article

Master's Dissertation: Optical and SAR Image Change Detection based on Diffusion Model

- Final Grade: excellent
- Full article

Researches

Land Cover Mapping and Updating for Long Time Series Remote Sensing Imagery

National Natural Science Foundation of China |General Project |Python *Jan. 2024 – Present*

- **Objective:**
  - Construct a self-supervised comparative learning pre-training model guided by remote sensing prior knowledge to improve model's general representation ability for complex remote sensing scenes.
  - Combine temporal decomposition and deep learning techniques to extract interpretable temporal deep semantic features.
  - Exploit a cross-sensor meta-learning technique of knowledge-features joint alignment for classification mapping and dynamic updating of cross-sensor long time-series images.
- **Contribution:**
  - Proposed DiffPurifier, introducing diffusion models into the optical and SAR CD task.
  - Integrated image translation and feature extraction to form an end-to-end model, alleviating the degrading problem during the feature propagation.
  - Introduced a superpixel-enhanced CD network to reduce the impact of noise and enhance the homogeneity of the detected area.
  - Demonstrated the effectiveness of the proposed method through experiments on four public datasets.
- **Outcome:**
  - Published a first-author research article in the **IEEE Transactions on Geoscience and Remote Sensing (TGRS) (JCR Q1, IF=8.6)**).

Theories of Video Remote Sensing Information Processing and Its Typical Geoscience Applications

National Natural Science Foundation of China |Major Project |Python *Jan. 2023 – Present*

- **Objective:**

    - Construct a spatio-temporal information compensation mechanism between dynamic targets to realize the reconstruction of key dynamic information of weak targets.
    - Combine trajectory prediction and re-identification technology to achieve accurate tracking of weak targets, precise detection and localization of abnormal event areas.
    - Develop migration and fusion models between spatio-temporal features and dynamically inverted physical quantities to realize full-element and highly dynamic cognition of emergencies.
- **Contribution:**
    - Proposed optSARCDdiff, which directly generates the change map through iterative denoising.
    - Designed a Multi-Frequency Noise Predictor (MFNP) to implicitly model the nonlinear cross-modal mapping between optical and SAR domains.
    - Employed FFT to decouple high- and low-frequency features, improving the expressiveness of change-related differences and introducing frequency-domain priors into the diffusion process.

Research on Limit Intrusion Detection Method Based on LiDAR Point Cloud Data

Python |Matlab *Nov. 2019 – Oct. 2021*

- **Objective:**
    - Combine train positioning and orientation system and mobile measurement platform to realize feature extraction and limit intrusion detection of railway surrounding facilities and environmental elements.
    - Detect limit intrusion events to realize high-efficiency and high-reliability railway monitoring.
    - Provide technical support for the development of detection from low-efficiency, high-cost, and intensive manual measurement to intelligent testing.
- **Contribution:**
    - Transformed the coordinate system of motion trajectories and generated point cloud models.
    - Extracted the track line and used the coordinate information from the point cloud to calculate the distance between the object and the track line.
- **Outcome:**
    - Accepted as a qualified provincial-level project.

Activities

Student Editor

Taylor & Francis Online Geo-spatial Information Science (GSIS) (JCR Q1, IF=5.5) *Dec. 2023 – Present*

- Translate and publicize articles published in the journal
- Operate the journal official account
- Edit videos to promote special columns

Assistant Management

Student Mental Health Education Center at Wuhan University *July 2024 – July 2025*

- Operate the counseling system
- Arrange visiting students and answer therapy-related questions

Skills

Programming Languages: Advanced: Python, Matlab / Intermediate: C++, Html / Beginner: R

Tools: Pytorch / TensorFlow / CUDA (GPU) / Linux Systems / ArcGIS / FileZilla / XShell / Latex / Video Editing

Language: Mandarin: 2A / CET-6: 532 / TOEFL: 89 (to be updated)

Awards

- Graduate Freshman Scholarship(10%) (2022)
- Outstanding Graduates(10%) (2022)
- 2rd Class Academic Scholarship(10%) (2021,2020)
- Merit Student(10%) (2021)
- 2rd Prize, Surveying and Mapping Skills Competition (2021)
- Outstanding Student(23%) (2020,2019)
- Hi-Target Special Scholarship (2019)
- 1st Class Academic Scholarship(5%) (2019)