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EDUCATION & GPA

State Key Laboratory of Information Engineering in Survey, Mapping and Remote Sensing (LIESMARS), Wuhan University | Wuhan, China *Sept.,2019-Jun.,2022(EXP)*

- ***M.S*** in *Photogrammetry and Remote Sensing* GPA: 90.8/100

School of Resources and Environmental Engineering, Anhui University | Hefei, China *Sept.,2015-Jun.,2019*

- ***B.S*** in *Geomatics Engineering* GPA: 4.4/5.0 (ranking: 1/230)

HONORS & AWARDS

- National Scholarship for Postgraduates (**Top 1 in 169**) *Oct., 2020*
- LIESMARS Scholarship for Excellent First-Year Postgraduates (**Top 9 in 169**) *Sept.,2019*
- Excellent Graduate of Anhui Province, China (**Top 1%**) *May, 2019*
- One First Prizes and Two Second Prizes of Academic Scholarship of Anhui University *Oct., 2018*
- National Scholarship for Undergraduates (**Top 2 in 230**) *Oct., 2017*
- Anhui University Scholarship for Excellent Students (**Top 3%**) *Oct., 2016*
- Second Prize of ESRI Cup GIS Software Development Contest in China (**Top 6 in 105**) *Nov., 2018*
- Second Prize of GIS Contest in Anhui Province (**Top 5%**) *Sept.,2018*
- Outstanding Prize of National Survey and Mapping Contest in Programming (**Top 3 in 113, also the first time for universities in Anhui Province to win the prize**) *July, 2018*
- Meritorious Winner of the US Mathematical Contest in Modeling *Apr., 2018*
- Second Prize of China National Mathematical Contest in Modeling (**Top 3%**) *Nov., 2017*

RESERCH INTERESTS

Deep Learning; Machine Learning; Transfer Learning; Domain Adaptation; Unsupervised Learning; Weakly-supervised Learning; Computer Vision; Image Processing; Remote Sensing Image Interpretation; Change Detection; Point Cloud Data Processing; Indoor Positioning

PUBLICATIONS

H. Chen, C. Wu, B. Du, L. Zhang, and L. Wang, "Change Detection in Multisource VHR Images via Deep Siamese Convolutional Multiple-Layers Recurrent Neural Network," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 58, no. 4, pp. 2848–2864, 2020.

H. Chen, C. Wu, B. Du, and L. Zhang, "Deep Siamese Multi-scale Convolutional Network for Change Detection in Multi-Temporal VHR Images," *2019 10th International Workshop on the Analysis of Multitemporal Remote Sensing Images (MultiTemp)*, Shanghai, China, 2019, pp. 1-4. (Oral)

C. Wu, **H. Chen,** B. Du, and L. Zhang, "Unsupervised Change Detection in Multi-temporal VHR Images Based on Deep Kernel PCA Convolutional Mapping Network," *IEEE Transactions on Cybernetics*, 2019, https://arxiv.org/abs/1912.08628. (Supervisor as first author, Chen as the second, minor revision)

H. Chen, C. Wu, Y. Xu, and B. Du, "Unsupervised Domain Adaptation for Semantic Segmentation via Low-level Edge Information Transfer," 2021. (Submitted to ACM Multimedia)

H. Chen, C. Wu, and B. Du, "Towards Deep and Efficient: A Deep Siamese Self-Attention Fully Efficient Convolutional Network for VHR Image Change Detection," *IEEE Transactions on Neural Networks and Learning Systems*, 2020. (Under review)

H. Chen, C. Wu, B. Du, and L. Zhang, "DSDANet: Deep Siamese Domain Adaptation Convolutional Neural Network for Cross-domain Change Detection," *IEEE Transactions on Geoscience and Remote Sensing*, 2020, https://arxiv.org/abs/2006.09225. (Under review)

H. Chen, C. Wu, B. Du, and L. Zhang, "Change Detection in Multi-temporal VHR Images Based on Deep Siamese Multi-scale Convolutional Networks," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2020, https://arxiv.org/abs/1906.11479. (Under review)

C. Wu, J. Yuan, L. Ru, **H. Chen,** B. Du, and L. Zhang, "A Measurement of Transportation Ban inside Wuhan on the COVID-19 Epidemic by Vehicle Detection in Remote Sensing Imagery," 2020, https://arxiv.org/abs/2006.16098.

PROJECTS & RESEARCH EXPERIENCES

Theoretic Research on Scene Change Detection Method of Time-series High-resolution Remote Sensing Image Based on Deep Slow Feature Analysis (A Project Funded by National Natural Science Foundation of China)

Key member | Sigma Laboratory of Wuhan University *Jan., 2020 - Present*

Advisor: WU Chen, Associate Professor at LIESMARS, Wuhan University

- Proposed the concept of cross-domain change detection, introduced domain adaptation into change detection, and presented a deep siamese domain adaptation convolutional neural network for cross-domain change detection.
- Assisted to design and implement a vehicle detection algorithm in very-high-resolution (VHR) images based on local anomaly detection, deep learning, and spectral information post-processing.
- Labeled a multi-temporal vehicle detection data set to evaluate the performance of different vehicle detection algorithms.

Research on Scene Change Detection Method of High-resolution Remote Sensing Image Based on Slow Feature Analysis (A Project Funded by National Natural Science Foundation of China)

Key member | Sigma Laboratory of Wuhan University *Mar., 2019 - Dec., 2019*

Advisor: WU Chen, Associate Professor at LIESMARS, Wuhan University

- Proposed a deep siamese convolutional multiple-layers recurrent neural network for multi-source change detection, which not only can process homogeneous images, but also effectively detect changes between heterogeneous images.
- Presented a novel deep kernel PCA convolutional mapping network for unsupervised binary and multi-class change detection in VHR images.
- Designed two deep siamese multi-scale convolutional neural networks to tackle the multi-scale changed objects in VHR images and presented two frameworks for unsupervised and supervised change detection, respectively.
- Labeled a scene change detection data set of high-resolution remote sensing images to evaluate the performance of scene change detection algorithms.

A Deep Learning Method Integrating Visual Attention Mechanism and Multi-feature for Oblique Photograph Point Cloud Classification

Key Member | Lanzhi Laboratory of Anhui University *May, 2018 - August, 2018*

Advisor: WU Yanlan, Professor at School of Resource and Environmental Engineering, Anhui University

- Preprocessed indoor point cloud data, and trained the PointSIFT model on ScanNet dataset for classifying indoor point cloud data.
- Designed and implemented a point cloud visualization tool based on OpenCV and Python, which could be used to visualize the segmentation results obtained by deep models.

Urban Road Defect Detection System Based on Deep Learning

Key Member | Lanzhi Laboratory of Anhui University *Feb., 2018 - May, 2018*

Advisor: WU Yanlan, Professor at School of Resource and Environmental Engineering, Anhui University

- Designed and established the framework of the urban road defect detection system.
- Obtained client side of the system with Android, built back-end server with Java, and established the database of the system with PostgreSQL and PostGIS.
- Independently developed an automatic sample generation tool for traffic signs with Python for the following urban road research.
- Collected urban road video data and GPS trajectory data and managed them in the established database.

Indoor/Outdoor Seamless Positioning and Navigation System Integrated with Multi-sensor of Mobile Phone (National Undergraduate Innovation and Entrepreneurship Project)

Initiator & Team Leader | Lanzhi Laboratory of Anhui University *Nov., 2016 - Nov., 2018*

Advisor: JIANG Peng, Associate Professor at School of Resource and Environmental Engineering, Anhui University

- Designed and established the framework of indoor/outdoor seamless positioning and navigation system.
- Obtained indoor/outdoor seamless positioning system of smart terminals and data acquisition tools with Android, built back-end server with Java, and established the database of the system with PostgreSQL and PostGIS.
- Proposed and implemented a multi-sensor indoor/outdoor seamless positioning and navigation algorithm based on GPS, WIFI, NFC, and inertial positioning.
- This project was judged as excellent at the end and the established system has won one national second prize, one second prize of Anhui Province, and one software copyright.

OTHER EXPERIENCES

Humanitarian Support and AI Development of UNOSAT

Intern | United Nations Institute for Training and Research (UNITAR) *May., 2021 - Present*

- Exploration and implementation of machine learning algorithms for various applications using optical and radar satellite imagery.
- Development of code and software to implement the needed workflow and pipeline to prepare satellite imagery for AI-based analysis and conversion of results to standard geospatial formats.
- Participation in UNOSAT AI efforts on refugee settlement mapping, flood mapping, vegetation mapping, damage assessment, simulated imagery, and other topics.

Long-term Practice of Mathematical Modeling

Group Leader & Member | Mathematical Modeling Competition Team of Anhui University *Mar., 2017 - Apr.,2018*

Advisor: ZHOU Ligang, Professor at School of Mathematics Sciences, Anhui University

- Systematically studied mathematical modeling and data mining, and finished five papers on mathematical modeling.
- Applied optimization models to crowdsourcing problems, and solved these models using different heuristic algorithms.
- Used statistical modeling and machine learning to find key factors related to energy consumption conditions, establish effective indicators for describing energy structure, and predict future energy situation.
- Designed an innovative algorithm based on ant colony algorithm and cluster analysis for shredded paper stitching.
- Adopted a fuzzy analytic hierarchy process and a statistical regression model to evaluate the mental health of students.

SKILLS, ACTIVITIES & INTERESTS

- **Reviewer:** IEEE Transactions on Image Processing, IEEE Transactions on Neural Networks and Learning Systems, Pattern Recognition, IEEE Transactions on Geoscience and Remote Sensing, Neurocomputing, IEEE Geoscience and Remote Sensing Letters, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing
- **Programming:** Python, Java, Android, VB.Net, C#, C/C++, R, SQL (PistgreSQL+PostGIS), Latex
- **Deep Learning Framework:** Pytorch, Tensorflow, Keras
- **Software:** MATLAB, ENVI, ArcGIS, eCognition, GoogleEarth, SPSS, Lingo, Geoda, AutoCAD, Photoshop, CityEngine, SketchUp, proficient in PowerPoint
- **Interests:** Playing table tennis, Roller skating, Outdoor cycling, Reading, Watching movies, Programming