

Qianbao Hou

Education

Wuhan University

M.S. Resources and environment

Sept. 2021 – Present

Wuhan, Hubei, China

Wuhan University

B.S. Surveying and Mapping Engineering

Sept. 2017 – Jun. 2021

Wuhan, Hubei, China

Publications

Qianbao Hou, Rui Xia, Jiahuan Zhang, Yu Feng, Zongqian Zhan, Xin Wang, "Learning visual overlapping image pairs for SfM via CNN fine-tuning with photogrammetric geometry information", *International Journal of Applied Earth Observation and Geoinformation*, Volume 116, 2023

Yu Tian, **Qianbao Hou**, Dan Dou, Jian Tang, "Traffic Congestion Prediction Model Based on Ensemble Learning", *Computer & Telecommunication*, 2020(4):5

Research Experience

The Ecological Impact and Needs of the Three Dragons in Game of Thrones

Jan. 2019

The International Mathematical Contest in Modeling

America

- Created a cellular automata all based on Penna rules to simulate the community
- Established a mathematical model of daily energy consumption over time
- Arranged test data and finished our paper *The Ecological Impact and Needs of the Three Dragons in Game of Thrones* with my teammates

Traffic Congestion Prediction Model Based on Ensemble Learning

Mar. 2020 – Sept. 2019

School of Geodesy and Geomatics, Wuhan University

Wuhan, Hubei, China

- KNN-VA model: The Euclidean distance was used as the measurement standard, and the KNN algorithm was used to select the K samples closest to the test sample. The average value was taken as the prediction speed
- KNN-RBF model: On the basis of KNN-VA, the standardized training samples were input into the trained RBF Network to predict the velocity
- Boosting algorithm was used to fuse A and B to improve prediction performance
- Finished our paper *Traffic Congestion Prediction Model Based on Ensemble Learning* and the paper was published in the journal *Computer & Telecommunication*

Comparative Analysis and Research of Open Source V-SLAM

Sept. 2020 – Sept. 2021

School of Geodesy and Geomatics, Wuhan University

Wuhan, Hubei, China

- Summarized the process and advantages and disadvantages of each visual slam method
- Designed experiments to compare the differences between different Visual SLAM methods
- Evaluated from the following aspects: whether they can operate normally, the time efficiency of operation, the absolute track error after operation and relative track error
- Finished my undergraduate thesis *Comparative Analysis and Research of Open Source V-SLAM Framework*

Ultra-wideband Accurate Localization Problem under Signal Interference

Oct. 2021

China Graduate Mathematical Contest in Modeling

China

- Preprocessed the UWB data with and without signal interference
- Established a localization model for predicting the precise position of the target and a classification model for judging whether the signal has interference

- Verified the reliability of the model and finished our paper *UWB Accurate Localization Problem under Signal Interference* with my teammates

3D-Aware Image Synthesis

Oct. 2021 – Feb. 2022

School of Geodesy and Geomatics, Wuhan University

Wuhan, Hubei, China

- Mastered the principle of neural radiance fields: NeRF, GRAF, GIRAFFE
- Mastered the principle of radiance fields without neural networks: Plenoxels
- Carried out relative contrast experiments, and evaluated from rendering a photo speed, train time, PSNR, SSIM and LPIPS
- GPU was applied to speed up my program

Learning Visual Overlapping Image Pairs with Geometric Information

March. 2022 – Present

School of Geodesy and Geomatics, Wuhan University

Wuhan, Hubei, China

- We fine-tuned several popular CNNs (Alexnet, VGG, ResNet) according to the regularities which are tailored for determining mutual overlapping image pairs for SfM
- A new training dataset consisting of regular photogrammetric images and crowdsourced images from the Internet was generated by fully considering photogrammetric requirements and 3D mesh models
- Learnable multiple NetVLADs for each regional information were employed to further improve the retrieval performance
- Finished our paper *Learning Visual Overlapping Image Pairs for SfM via CNN Fine-Tuning with Photogrammetric Geometry Information* and the paper has been accepted by International Journal of Applied Earth Observation and Geoinformation (JCR Q1). I was the first author

Other Experience

Leader

Jun. 2019 – Jul. 2019

School of Geodesy and Geomatics, Wuhan University

Shenzhen & Guangzhou, Guangdong, China

- Served as the leader of the "Zhixing Dawan" practice team of School of Geodesy and Geomatics to Guangdong-Hong Kong-Macao Greater Bay Area
- Conducted interviews with Shenzhen Municipal Planning Bureau and Guangzhou Urban Planning Institute of Exploratory Surveying and Mapping

Intern

Oct. 2021-Feb. 2022

Perceptive Space

Wuhan, Hubei, China

- responsible for 3D reconstruction

Awards & Honors

The Third Class Scholarships of Wuhan University

Wuhan University

2017-2021

The reputation of outstanding college students of Wuhan university

Wuhan University

2019

The reputation of outstanding graduate of School of Geodesy and Geomatics

Wuhan University

2021

Third class Award of the eighteenth China Graduate Mathematical Modeling Competition

Hua Wei

2021

Advanced Individual Innovative Practice Competition of Wuhan University

Wuhan University

2021

The Second Class Scholarships of Wuhan University

Wuhan University

2022

Specialized Skills

Programming: MATLAB, C, C#, Python, FORTRAN, PyTorch, ROS

Others: MS office, L^AT_EX, Sketchbook, ENVI, ERDAS