Zihui Zhou

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RESEARCH INTERESTS

Multi-modal Representation Learning,Vision-Language Models, Computer Vision, Remote Sensing AI

EDUCATIONAL BACKGROUND

Chongqing University (Project 985, 211) **Chongqing, China**

MSc in Computer Science and Technology Sep. 2023-Present

GPA: 4.5/5.0 **Weighted Average Mark:** 95.29/100.00

Chongqing University (Project 985, 211) **Chongqing, China**

BSc in Computer Science and Technology Sep. 2019-June 2023

GPA: 3.7/4.0 **Weighted Average Mark:** 88.59/100.00

RESEARCH EXPERIENCE

Assessment and Mitigation of Hallucinations in Multimodal Large Language Models within the Domain of Remote Sensing

Researcher | Advisor: Prof. Feng Yong Oct. 2024-Mar. 2025

- Characterized MLLM hallucination patterns in the remote sensing field, establishing a taxonomy that categorizes 4 different hallucination types.
- Proposed an MLLM hallucinations detection suite: including the RSHalluEval benchmark, evaluation metrics, and flexible automated hallucination detection strategies (for precision-focused and efficiency-focused scenes, respectively), and evaluated MLLM hallucinations in this domain.
- Introduced RSHalluShield: a hallucination mitigation dataset of 30,000 QA pairs.
- fine-tuned the model on the RSHalluShield dataset, resulting in a 12.33% increase in the hallucination-free rate. Superior performance is also achieved on downstream tasks.
- Submitted to *IEEE Transactions on Geoscience and Remote Sensing* (Q1, IF:8.2), under review (first author).

Fine-Grained Information Supplementation and Value-Guided Learning for Remote Sensing Image-Text Retrieval

Researcher | Advisor: Prof. Feng Yong Nov. 2023-Aug. 2024

- Proposed the fine-grained information supplementation (FGIS) module: enhancing the model's perception of multi-scale features in remote sensing images by fusing global and local visual features.
- Architected the value-guided learning framework (VGLF): including the designed weighted contrastive loss, scene-adaptive fine-grained perceptual loss, and two other losses, applying targeted strategies in different training phases to focus on the most valuable data during training.
- Conducted extensive experiments to demonstrate their effectiveness. For the quantitative experiment, the *mR* on the RSITMD and RSICD datasets have increased by 7.89% and 2.33% respectively compared with the baseline.

- One paper accepted by the *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (first author).

Project: Intelligent Environmental Monitoring System Based on Multi-source Satellite Remote Sensing Images

Project Member | Advisor: Prof. Feng Yong Sep. 2023-June 2024

- Developed a functional module for high-resolution remote sensing image segmentation, capable of segmenting objects of 13 categories in images of different sizes.
- Deployed the remote sensing MLLM GeoChat to implement intelligent remote sensing question answering.

Bachelor Thesis: Research and Implementation of Image Text Retrieval Based on Attention Mechanism

Researcher | Advisor: Prof. Feng Yong Oct. 2018-May 2019

- Developed an intra-modal loss function with three forms (visual, text, and combined modalities) to constrain global feature disparities between positive instances and hard negatives, thus obtaining superior global feature representation.
- Adopted two re-ranking algorithms to optimize the similarity matrix.
- Conducted experiments to demonstrate the superiority of the proposed model and developed a prototype image-text retrieval system based on it.

PUBLICATIONS

Zhou, Z., Feng, Y., Qiu, A., Duan, G., & Zhou, M. (2024). Fine-Grained Information Supplementation and Value-Guided Learning for Remote Sensing Image-Text Retrieval. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.

Zhou, Z., Feng, Y., Duan, G., Zhou, M., & Jia, W. (Under Review). Assessment and Mitigation of Hallucinations in Multimodal Large Language Models within the Domain of Remote Sensing. *IEEE Transactions on Geoscience and Remote Sensing.*

INTERNSHIP EXPERIENCE

Chongqing Longline Intelligent Technology Co., Ltd., Perception and Localization Department Chongqing, China

Algorithm Design Engineer Dec. 2024-Apr. 2025

- *Automated Labeling for Autonomous Driving Data:* Responsible for business data adaptation and prompt design for model inference. The whole project has been packaged as an operator to enable large scale data production.
- *Multi-modal Driving Data Generation:* Trained and optimized the 3D occupancy control generation model, including business data adaptation and model training and tuning for 3D scene reconstruction.

REWARDS & SCHOLARSHIPS

- University-level First-Class Scholarship Nov. 2024
- University-level First-Class Scholarship Nov. 2023
- University-level Merit Student Oct. 2024
- National-level Innovation and Entrepreneurship Training Program, Second-Level Completion June 2022

SKILLS & INTERESTS

- **Language skills:** Chinese (native); English (fluent)
- **Programming:** Python (PyTorch, OpenCV), C/C++, Java, SQL, LaTeX