

HAOQUAN ZHANG

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🎓 EDUCATION

South China University of Technology (SCUT), Guangzhou, China 2021 – Present

Undergraduate student in Data Science (DS), expected March 2025.

Research Interests: *Multi-Modality Tasks, Knowledge Distillation and 3D Reconstruction*

👤 PUBLICATION

** denotes paper under reviewing. The title and abstract of the paper under review have been rewritten to avoid violating the double-blind review process.*

Asymmetric Image Retrieval with Semi-Collaborative Distillation

**NeurIPS'2024 - Co-First Author*

- In asymmetric image retrieval systems, there is a significant capacity gap between the query and gallery network. The low-capacity query network struggles to effectively store and understand knowledge from the high-capacity teacher network. Therefore, we introduce a simple yet effective semi-collaborative distillation (SCD) framework, which can additionally adjust the gallery network because the gallery network has a redundant capacity to carry specific knowledge from the query network. Specifically, as the query network converges, we incrementally unfreeze the gallery network to smoothly adjust the feature space of the gallery network to be consistent with that of the query network.

Mask4Align: Aligned Entity Prompting with Color Masks for Multi-Entity Localization Problems

CVPR'2024 - First Author

- Pretrained VLMs excel in accurately recognizing and precisely localizing entities within VQA tasks. However, in visual scenes with multiple entities, textual descriptions struggle to distinguish the entities from the same category effectively. Consequently, the existing VQA dataset cannot adequately cover scenarios involving multiple entities. Therefore, we introduce a Mask for Align (Mask4Align) method to determine the entity's position in the given image that best matches the user input question. This method incorporates colored masks into the image, enabling the VQA model to handle discrimination and localization challenges associated with multiple entities.

👤 RESEARCH EXPERIENCE

Singapore Management University 2024 – present

Research Intern Adviser: Prof. Shengfeng He, Singapore

- 3D Gaussian Splatting
- Knowledge Distillation

South China University of Technology 2023 – present

Research Intern Adviser: Prof. Huaidong Zhang, Guangzhou, China

- Point Cloud Recognition
- Applications of Vision Language Models

👤 PROJECT EXPERIENCE

Perfect GunMayhem Remake: A 2D Shooting PVP Game Based on Cocos2d-x 2022

Course Design Course: Advanced Language Programming (C++)

GunMayhem Remake is a project independently completed by our team members, covering all aspects, including source code, game artwork, and music assets.

- Final Score: 99, 4.0/4.0. (1%)

- C++, Cocos2d-x (the game engine)
- Project Page: <https://haoquanzhang.github.io/GunMayhem/gunMayhem.html>

Design of Auxiliary Diagnosis Algorithm for Schizophrenia Based on Feature Fusion of EEG and ECG 2023

Entry The National BME Innovation Design Competition

Calculated brain functional network features, heart rate variability features and heart-brain coupling features to build machine learning models for automatic diagnosis; Deep learning models using ResNet were built based on original EEG and ECG also.

- Second Prize. (6%)
- Python, PyTorch, MNE-Python (a Python package for analyzing neurophysiological data)

⚙️ SKILLS

- Programming Languages: Python > C++ > Java
- Platform: Linux, Window
- Languages: English - Fluent, Mandarin - Native speaker

♥️ SELECTED AWARDS

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| <i>Meritorious Winner (7%)</i> , The Interdisciplinary Contest in Modeling (ICM), COMAP | 2021 |
| <i>3rd Prize (12%)</i> , The SCUT Scholarship, SCUT | 2022 |
| <i>3rd Prize (12%)</i> , The Huameng Scholarships, TCL Corporate | 2022 |
| <i>2nd Prize (5%)</i> , The Taihu Innovation Scholarship, Wuxi city government | 2022 |
| <i>2nd Prize (6%)</i> , The National BME Innovation Design Competition, China Society of BME | 2023 |
| <i>2nd Prize (8%)</i> , Hongpingchangqing Fund | 2023 |

📖 CORE COURSES

Physics (4.0/4.0), Python Programming (4.0/4.0), Advanced Language Programming (4.0/4.0), Linear Algebra (4.0/4.0), Computer Network (4.0/4.0), Java Programming (4.0/4.0), Course Design of C++ (4.0/4.0), Course Design of Data Structure (4.0/4.0)

📌 MISCELLANEOUS

- Personal Website: <https://haoquanzhang.github.io/>
- Hobby: Anime, Music Production (Electronic and R&B) and Graphic design
- Feel free to contact me. I look forward to exchanging ideas and engaging in friendly collaboration.