Zeru Shi

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Research Interests: LLM-Based Agent,Generative Artificial Intelligence, Trustworthy Machine Learning

EDUCATION

Dalian University of Technology, China, "Project 985" ***2021 – 2025***

B.Eng of Software Engineering

- **GPA:** 89.7 (3.97)
- **Core Courses:** Programming Basics C (99), Computational intelligence(99), Advanced Data Structure and algorithm(99), Advanced Programming (93), Operating System (97), Database (95)、Data Structure and algorithm (95), Differential geometry (97), Linear Algebra and Analytic Geometry (92), Method of Mathematical Physics(87)

RESEARCH EXPERIENCE

Project name: Lumina-3D: Generating and Recognizing Any 3D Representation at Any Resolution with Next-DiT. ***2024***

- I participated in the discussion and design of the model architecture of Lumina-3D, and designed a model that not only conforms to the working characteristics of Lunima model, but also can deal with 3D tasks.
- I wrote the code for Lumina3D's internal transformer attention module for 3D point cloud generation.

Project name: LLM-based Semantic File System based on AIOS ***2024***

- This work proposes a semantic-based file management system based on *vector database and LLM*, which can be operated by users directly using natural language prompts. Compared with the traditional file system or directly using LLM to semantically operate files, the file system proposed in this paper can avoid complex linux operations, and the accuracy and time efficiency of file operations have been greatly improved. For example, in the operation of semantic file retrieval, lsfs improves the accuracy by at least **15%** and the efficiency by at least **49%**.

Project name: Robust Deep Homography Estimation via Semantic-Driven Feature Enhancement ***2024***

- This paper introduces *pixel features, semantic features* combined with methods for homography estimation and a *meta-learning method* is adopted, and a *meta-feature extractor* is designed to *fuse pixel/semantic features* for training. Compared with the existing methods, the proposed method improves the index by at least **44%.**

Project name: Collaborative Adversarial Resilience for Robust Underwater Image Enhancement and Perception ***2023***

- This paper introduces **adversarial attacks** into underwater tasks, and propose a **robust network** for augmentation and detection tasks, which counteracts the attack component in the latent representation through a **reversible framework**.

PUBLICATION

[1] Zeru Shi, Kai Mei, Mingyu Jin, Yongfeng Zhang,et al: "From Commands to Prompts:LLM-based Semantic File System based on AIOS" in **International Conference on Learning Representations**.(under review).
ReasearchGate Link: https://www.researchgate.net/publication/384257895_From_Commands_to_Prompts_LLM-based_Semantic_File_System_for_AIOS

[2] Zeru Shi, Zengxi Zhang,et al, "SeFENet: Robust Deep Homography Estimation via Semantic-Driven Feature Enhancement" in **Association for the Advancement of Artificial Intelligence** (under review).

[3] Zengxi Zhang, **Zeru Shi,** et al,"CARNet: Collaborative Adversarial Resilience for Robust Underwater Image Enhancement and Perception" in **IEEE Transactions on Neural Networks and Learning Systems** (under review).

AWARDS

Dalian University of Technology, Japan NOK Corporation special scholarship ***2023***

Dalian University of Technology Study Excellent Scholarship (Three times) ***2022 - 2024***

Excellent Merit student of Dalian University of Technology (Three times) ***2022 - 2024***

SKILLS AND SELF-EVALUATION

- **Good foreign languages ability for reading and communication:**
  TOFEL 101; Japanese N3 equivalent level
- **Strong Programming Skills:**
  Proficient with SQL, C, C++, Python, Matlab
- **Familiar with machine learning deep learning basics:**
  Machine Leaning (Decision Tree, Meta-learning etc)Deep Learning(Pytorch,Tensorflow,CV,NLP basic knowledge)
- **Good at Mathematics:** Advanced Mathematics(93), Linear Algebra and Analytic Geometry (92)
- **Strong ability of teamwork and communication:** as the team leader lead the team and complete the works