Tianhai Liang 梁天海

Harbin Institute of Technology, Shenzhen University Town, Xili, Shenzhen, Guangdong Province, 518055, China

tianhailiang.cn@gmail.com, 200320403@stu.hit.edu.cn

EDUCATION

Harbin Institute of Technology, Shenzhen — Shenzhen, China
Bachelor of Science in Automation — 2020.8-2024.6
Minor in Computer Science and Technology Degree — 2021.8-2024.6

- **GPA:** 3.921/4.0; **Rank:** 6/237 (top 2.53%);
- **Honors:**
  - **2021 National Scholarship** (1 out of 226 awarded by comprehensive assessment)
  - **2021 First Class Academic Scholarship** (top 5% awarded by academic achievement)
  - **2021 Outstanding student model**
  - **2022 TOPBAND Outstanding Scholarship** (2 out of 237 awarded by comprehensive assessment)
  - **2022 First Class Academic Scholarship** (top 5% awarded by academic achievement)
  - **2022 Top Ten Outstanding Studying Stars** (10 out of all students in Harbin Institute of Technology)
- **Major Courses:**

  Robot Design and Practice(100/100), Digital Image Processing(99/100), C Language Programming(98/100), Probability Theory (98/100), Complex Analysis (97/100), Control Theory (97/100), Linear Algebra (94/100), etc.
- **Minor Courses:**

  Set Theory and Graph Theory, Data Structure, Algorithm Design and Analysis, Compilation Principle, Operating System, Java Language Programming, Principles of Computer Composition, Database System, etc.
- **Self-study courses based on interests:**

  Medical Imaging, Electrocardiogram Diagnostics, Anatomia, etc.

COMPETITION AWARD

• RoboMaster University Championship	**National First Prize**	2022.06
• National Undergraduate Electronics Design Contest	**National Second Prize**	2021.12
• National Undergraduate Smart Car Contest	**National Third Prize**	2021.12
• China Undergraduate Mathematical Contest in Modeling	**Provincial First Prize**	2022.10
• National Undergraduate Smart Car Contest	**Provincial Second Prize**	2022.08
• Mathematical Contest in Modeling	**Honorable Mention**	2022.04
• China Undergraduate Mathematical Contest in Modeling	**Provincial Third Prize**	2021.11

PUBLICATIONS

* indicates equal contribution.

- **T. Liang***, Q. Shen*, S. Wang, Y. Chen, G. Zhang, J. Chen, "Data Completion-Guided Unified Graph for Incomplete Multi-View Clustering"**,** *ACM Transactions on Knowledge Discovery from Data (**TKDD**), 2023.* **Under Review.**
- B. Zhou, H. Zhou*, **T. Liang***, Q. Yu, S. Zhao, Y. Zeng, J. Lv, S. Luo, Q. Wang, X. Yu, H. Chen, C. Lu, and L. Shao, "ClothesNet: An Information-Rich 3D Garment Model Repository with Simulated Clothes Environment", *IEEE International Conference on Computer Vision (**ICCV**), 2023.*

EXPERIENCE

- **Research on Incomplete Multi-view subspace Clustering (IMC)** — **Mar. 2022 – Mar.2023**

  Bio-Computing Research Center — *Harbin Institute of Technology, Shenzhen*

  Advisors: Prof. Yongyong Chen — *Department of Computer Science and Technology*

  - **Introduction:** To solve the problem that the traditional incomplete multi-view subspace clustering algorithm is difficult to complete missing data efficiently and can not get a uniform similarity matrix directly, we propose a unified graph learning method guided by data completion (DCUGL).

- **Involvement:**
  - Established the proposed algorithm model.
  - Derived the model optimization process so that outstanding models can be solved iteratively.
  - Wrote Matlab code independently and conduct experiments on a large number of datasets.
  - Analyzed and process experimental data, draw paper pictures, and write papers.
- **Outcome:** Under the guidance of the teacher, wrote the paper ***" Data Completion-Guided Unified Graph for Incomplete Multi-View Clustering"*** **(as the first author)**, which was submitted to *ACM Transactions on Knowledge Discovery from Data* ***(TKDD)(JCR-Q1)***, and is under evaluation.

• Research on Simulated Clothes Manipulation Environment with 3D Model Repository Nov.2022–Mar.2023

School of Computing *National University of Singapore*
Advisors: Prof. Lin Shao *Department of Computer Science*

- **Introduction:** Created ClothNet dataset and simulation environment with clothing features, boundary lines and key points. As far as we know, this is the first large-scale dataset with rich clothing operation notes.
- **Involvement:**
  - Wrote script files and call professional software API to collect and process data files automatically.
  - Conducted a lot of benchmark tests on the created dataset, including 3D point cloud segmentation, 3D points cloud classification, 2D image segmentation, 2D image classification, and robot operation simulation of clothing.
- **Outcome:** Wrote the paper ***"ClothesNet: An Information-Rich 3D Garment Model Repository with Simulated Clothes Environment"*** **(as the co-second author)**, which was submitted to *IEEE International Conference on Computer Vision* ***(ICCV)(CCF-A)***, and is under evaluation.

• Research on deep subspace clustering network for image segmentation Mar.2023 – Present

Bio-Computing Research Center *Harbin Institute of Technology, Shenzhen*
Advisors: Prof. Yongyong Chen *Department of Computer Science and Technology*

- **Introduction:** Add constraints of low rank and maximum entropy to the self-expression layer, so as to achieve a better clustering effect for pixels and optimize the image segmentation effect.
- **Involvement:**
  - Read papers and come up with this idea.
  - As it has only just begun, it is still ongoing…

• Research on Amphibious Robots Nov.2020 – Oct.2022

nROS-Lab *Harbin Institute of Technology, Shenzhen*
Advisors: Prof. Haoyao Chen *Department of Mechanical Engineering and Automation*

- **Introduction:** Study the perception of the environment by amphibious robots in diverse environment.
- **Involvement:**
  - Used PyTorch to design an LSTM-based model to find the potential physical variables contained in the tactile and gyroscope sensor timing data of the amphibious robot.
  - Designed the STM32 embedded control code of the amphibious robot to control of the robot's gait.
  - Maintained electrical hardware for amphibious robots.
  - Learnt how to use the Robot Operating System (ROS).

• Research on Trading Strategy of Volatile Assets in MCM Feb.2022 – Feb.2022

- **Introduction:** Given the price-date chart and initial capital of two kinds of volatile assets, a trading strategy is designed to make the final income as high as possible.
- **Involvement:**
  - Designed a model for integrating LSTM and CNN innovatively.
  - Wrote code independently, conducted experiments and analyzed the experimental results.
  - Worked with team-mates to write a paper within 4 days and finally won the Honorable Mention in MCM.

SKILLS

Programming: C, C++, Java, Python, MATLAB
Tools: Pytorch, ROS, Latex, YOLO, Nimble Physics, Diffcloth