YUE DAI

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EDUCATION

Tsinghua University, School of Software 2020 - 2023
Master of Software Engineering, *Beijing*
GPA:3.75/4.00 Supervisors: Yue Gao & Xinbin Zhao
Beihang University, School of Software 2016 - 2020
Bachelor of Software Engineering, Double major in Mathematics and Applied Mathematics *Beijing*
GPA:3.77/4.00 Top 5%

RESEARCH EXPERIENCE

Research Assistant and Master Student Oct 2019 - Present
Intelligent Media and Cognition Laboratory, Tsinghua University *Beijing*

- **3D point cloud rotation invariant recognition and retrieval** via global-local consistent correlation modeling on hypergraph. To address the degradation due to inconsistent point cloud orientations, we propose enhancing the intra-class consistency of the data at both global and local levels. The two features are homogeneous and of complementarity. Therefore, we use both features to construct multi-hypergraphs, which capture complex higher-order associations between rotating point clouds. To achieve superior representations , we introduce an inductive hypergraph cross-attention module. The proposed framework achieves state-of-the-art performance on both synthetic and real-world 3D object datasets.
- **3D object cross-modal retrieval** based on heterogeneous dynamic graphs. Proposed explicit relationship modeling based on the dynamic graph to enhance the identification ability of intra-domain representation. Generated heterogeneous representation of the sample based on the inherent correlation of the homogeneity of the dynamic dichotomous graph modeling data.
- **3D object detection based on modal fusion**. The work uses interpretable features of image target detection to improve the point cloud detection performance. Divided the three types of features into geometry, texture, and semantics to enhance the point cloud column features. Awarded excellent undergraduate graduation thesis at Beihang University.

Research Intern Nov 2018 - Apr 2019
Prof. Zhouchen Lin's laboratory, Peking University *Beijing*

- Conducted a research project on the optimization algorithm LPOM, resulting in a paper accepted by T-PAMI. Proposed and optimized a GPU parallel implementation of the LPOM algorithm to accelerate its performance.

IEEE Signal Processing Letters Reviewer 4 Times

ACM International Conference on Multimedia 2023 Reviewer

PROFESSIONAL EXPERIENCE

CRRC Sifang-Tsinghua Rail Transit Vehicle Intelligent Maintenance Project. Dec 2019 - Jun 2022
1) Designed and developed a distortion correction algorithm for line scan images.
2) Designed and participated in the development of a point cloud registration-based defect detection system for the maintenance robot.
3) Was responsible for the construction of the laser 3D scanning system.

OPPO Research Institute Cooperation Project May 2021 - Jul 2021
Built a binocular camera and completed the development of equipment calibration, depth imaging, and other functions.

Plant Pest Recognition System Based on Mobile Devices. May 2018 - Mar 2019
As a team leader supervised by Prof. You Song at Beihang University, I focused on the resource bottleneck of AI model landing. I designed and developed a browser-side and client-side collaborative plant pest detection software and innovatively used edge reasoning resources to realize offline prediction deployment of model algorithms. Won the second prize in the Science and Technology Competition of Beihang University and the third prize in the Entrepreneurship competition of Beihang University.

HORNORS & AWARDS

First-level prize in 2021 World Intelligent Driving Challenge, Simulation Autopilot Track. May 2021
Friends of Tsinghua-Shandong Binzhou Talent Scholarship Nov 2021
Second Prize of National College Students Mathematics Competition (Non-Mathematics, Beijing) 2017 & 2018
Beijing outstanding graduate (5%) Jun 2020
Beihang University Student of the Year (6%) 2018 & 2019
Beihang University Outstanding Student Cadre of the Year (3%) 2017
First prize in National Mathematical Olympiad for High School in province (Top 50 in Shandong Province, ranked 18th) 2015

PROGRAMMING SKILLS

Python, C/C++, Pytorch, openCV, open3D, Qt
Familiar: Matlab, Tensorflow, Javascript, CUDA, JAVA, C#

PUBLICATIONS

Yue Dai, Shihui Ying, Yue Gao. Exploring Local and Global Consistent Correlation on Hypergraph for Rotation Invariant Point Cloud Analysis, **submitted to IEEE TMM**, 2023.
Yue Dai, Yifan Feng, Nan Ma, Xibin Zhao, Yue Gao. Cross-Modal 3D shape retrieval via heterogeneous dynamic graph representation, **submitted to IEEE T-PAMI**, 2022.
Jia Li, Mingqing Xiao, Cong Fang, **Yue Dai**, Chao Xu, Zhouchen Lin. Training neural networks by lifted proximal operator machines, **IEEE T-PAMI**, 2020.

PATENTS

Recognition and Retrieval Method and Apparatus for Three-Dimensional Point Cloud Objects in Arbitrary Poses (Application No.: CN202310554432.6, 2023.05.17) - Publication, Initiative for examination as to substance, Inventors: Yue Gao, **Yue Dai**
Cross-Modal Three-Dimensional Object Retrieval Method and Apparatus (Application No.: CN202210145571.9, 2022.02.17) - Publication, Initiative for examination as to substance, Inventors: Yue Gao, **Yue Dai**, Xibin Zhao
Multi-Modal Three-Dimensional Object Detection Method and Apparatus Based on Image and Point Cloud Fusion (Application No.: CN202111266214.X, 2021.10.28) - Publication, Initiative for examination as to substance, Inventors: Yue Gao, **Yue Dai**, Xibin Zhao