JUNBIN GAO

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EDUCATION

National University of Singapore, Singapore Jan. 2024 - present

Ph.D. student in Department of Pharmacy
- **Supervisor**: Dr. Boxiang Liu
- **Fellowship**: NUS Research Scholarship
- **Research Interests**: AI for bioinformatics.

Tsinghua University, China Jul. 2021 - Mar. 2023

R.A. in Department of Computer Science and Technology
- **Supervisor**: Dr. Xiaolin Hu
- **Research Interests**: Computer Vision and deep learning, especially object detection and 3D scene understanding.

Huazhong University of Science and Technology, China Aug. 2020 - Jun. 2023

M.S. in Artificial Intelligence and Automation
- **Supervisor**: Prof. Zhigang Zeng (IEEE Fellow)
- **Fellowship**: First Prize Scholarship of HUST

Northeastern University, China Aug. 2016 - Jun. 2020

B.E. in Measurement and Control Technology and Instrumentation
- **GPA**: 87.6/100. Top 5%.
- **Fellowship**: National Scholarship, China Telecom Scholarship.

PUBLICATIONS

1. Tian C, Zhang Y, Tong Y, Kock KH, Sim DY, Liu F, Dong J, Jing Z, Wang W, **Gao J**, Tan LM. Single-cell RNA-seq links cell-type-specific regulation of splicing with complex diseases. Nature Genetics, 2024. [paper]
2. **Junbin Gao**, Junjie Zhang, Shaojin Wu, Hao Ruan, Junting Lv, Lianguang Liu, Yin Sheng and Zhigang Zeng. PSIDet: Probabilistic Structure Information from Point Cloud for 3D Object Detection. (Available at SSRN) [paper]
3. **Junbin Gao**, Hao Ruan, Bingrong Xu, Zhigang Zeng. DAFormer: Depth-aware 3D Object Detection Guided by Camera Model via Transformers. IEEE International Conference on Cyborg and Bionic Systems (CBS), 2022. [paper]
4. Hao Ruan, Bingrong Xu, **Junbin Gao**, Lianguang Liu, Junting Lv, Yin Sheng and Zhigang Zeng. GNet: 3D Object Detection from Point Cloud with Geometry-Aware Network. IEEE International Conference on Cyborg and Bionic Systems (CBS), 2022. [paper]

RESEARCH EXPERIENCE

Tsinghua Laboratory of Brain and Intelligence (THBI) Jul. 2021 - Oct. 2022

Visiting Student in Department of Computer Science and Technology Beijing, China

Worked on 3D object detection tasks based on point cloud only & multi-view images only & multi-modal fusion.
1. Extend the work of StructNet, we proposed a point clound based network, named PSIDet. We design a Weighted Boundary Prediction (WBP) module, aiming to encourage the detector pay more attention to the structure information of the object and a feature fusion module by enhancing the structure representation on the 3D point cloud.
2. Investigate the work of multi-view based & multi-model based 3D detection, reproduce BEVFormer, PETR, Transfusion and other recent work to explore a new paradigm of multimodal 3D object detection, related work is in progress.

Microsoft Research Asia (MSRA) Jan. 2021 - Jun. 2021

Intern of Intelligent Multimedia Group Beijing, China

Worked on object detection tasks and we proposed StructNet (consists of the SEM module and the residual block of ResNet) as the backbone to explicitly extract structure feature in multiple downstream tasks (classification, detection and segmentation). Our StructNet backbone leads to significant improvement of the generalization on all the tasks, and achieves the SOTA results.

Mech-Mind Robotics Dec. 2019 - Mar. 2020

Intern of Deep Learning Group Beijing, China

1. Completed the testing and development of the deep camera SDK, including image acquisition, TX2 environment deployment, remote compilation testing, etc.
2. Explored the deep network model based on point cloud classification and detection to achieve the identification of object materials and 3D space localization.

SELECTED PROJECTS

AI Innovation and Application Competition (AIAC) Oct. 2021 - Dec. 2021

Second Prize (Top 5%) Shenzhen, China

We focus on 3D object detection task via point cloud. We analize the dataset provided by deeprout. We design a voxel-based network to exstract the features and use a fpn-like architecture to unique detect the different size of object by dilated conv layers for using high resolution feature map to detect small size of objects. Besides, we propose ROS-training and OD-IoU loss for getting higher performance. We finally get 66.7 mAP on the testset.

Rocket Army Artificial Intelligence Challenge Sep. 2020 - Nov. 2020

Top 5% Xi'an, China

We worked on designing algorithm to detect object from LIDAR images. Based on the object detection algorithm Yolov3, the backbone part of the convolutional neural network model suitable for the competition dataset is redesigned. we achieved 50.9 mAP and 60FPS while testing.

National Electronic Design Competition (TI Cup) Apr. 2019 - Sep. 2019

First Prize (Top 2%) Shanghai, China

We designed a vision based UAV, which can realize high-precision flight control and complete the automatic detection of power cables, including the functions of finding foreign objects and giving an alarm, returning the status of foreign objects and so on.

HONORS & AWARDS

- HUST Scholarship — Second Prize, 2022
- AI Innovation and Application Competition(AIAC) — Second Prize, 2021
- HUST Scholarship — Second Prize, 2021
- Huawei Cup Mathematical Modeling Contest — Second Prize, 2020
- HUST Scholarship — First Prize, 2020
- HUST Freshman Scholarship — Second Prize, 2020
- China Telecom Scholarship — FeiYong Prize, 2019
- Electronic Design Competition(TI Cup) — First Prize, 2019
- Challenge Cup Competition — Sliver Prize, 2018
- Mathematical Contest in Modeling(MCM) — Meritorious Winner, 2018
- National Scholarship (The highest scholarship for undergraduate in China.) — 2017

TECHNICAL SKILLS AND INTERESTS

Languages: Native Chinese, Fluent English (IELTS: 6.5, GRE: 320)

Programming: Python, C, Pytorch, Tensorflow, Shell, LaTeX, HTML, JavaScript, etc.

Others: Familiar with Linux, front-end and back-end technologies, as well as database technology.