Ziyi Yin

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EDUCATION

Xi'an Jiaotong University Xi'an, China

Master of Science in Control Science and Engineering 09/2019 - 06/2022 (expected)

Directed by *Prof. Zejian Yuan* at IAIR (Institute of Artificial Intelligence and Robotics)

Xi'an Jiaotong University Xi'an, China

Bachelor of Science in Automation (Honors Youth Program) 09/2013 - 06/2019

GPA: 87.74/100 (rank 2/14)

PAPER & PATENT

Papers

- **Z. Yin**, R. Liu, Z. Xiong, Z. Yuan. *Order-independent Matching with Shape Similarity for Parking Slot Detection.* To be appear in BMVC, 2021.
- **Z. Yin**, R. Liu, Z. Xiong, Z. Yuan. *Multimodal Transformer Network for Pedestrian Trajectory Prediction.* In IJCAI, 2021.
- Z. Song, **Z. Yin**, Z. Yuan, C. Zhang, W. Chi, Y. Ling, S. Zhang. *Attention-Oriented Action Recognition for Real-Time HRI.* In ICPR, 2020.
- **Z. Yin,** Z. Song, Z. Yuan. *Learning to Plan Semantic Free-Space Boundary*. In ICIP, 2019.

Patent

- *An AI-based action recognition method and related devices***.** Chinese Patent, published in 02/2020.

CORE RESEARCH & ENGINEERING PROJECTS

Perception of Autonomous Driving 12/2018 - 09/2021

■ **Parking Slot Detection**

To detect parking slots in the more general scenarios (variant sizes and shapes), we

- Constructed a Large-scale and Remote-view Parking Slot dataset (LRPS).
- Proposed a two-level order-independent matching strategy to solve the order induced rotation problem

My contributions: dataset construction, proposal providing, paper writing

■ **Pedestrian Trajectory Prediction**

To solve the problems of current CNNs or RNNs in compensating the highly dynamic motion information and massive parameters usages, we

- Introduced the specific areas of optical flow to compensate the dynamic motion information, and propose a compact representation method to improve the computational efficiency.
- Proposed a Multimodal Transformer Network (MTN) to integrate distinct modalities in a multi-granularity manner.
- Our method achieved the SOTA performance with 107x fewer parameters on public datasets.

My contributions: investigation, proposal providing, paper writing

■ **Semantic Free-space Detection**

To provide the specific semantic information of detected free-space, and to describe the surrounding drivable situation more efficiently, we

- Proposed a novel task for free-space detection. The task aims to produce a semantic boundary instead of pixels belonging to road to specify the specific drivable area and obstacles.
- Proposed a multi-stage CNN to produce boundary heatmaps with high resolutions and generate the semantic free-space boundary after using dynamic programming.
- Constructed a new dataset that contains diverse scenarios, achieving impressive locating performance.

My contributions: proposal providing, paper writing, patent writing, dataset construction

Human-Robot Action Interaction 06/2019 - 12/2020

■ **Human Action Recognition in HRI**

To adapt to specific scenes and camera viewpoints and achieve real-time interaction on a mobile computing platform (Nvidia Jetson AGX Xavier), we

- Constructed a multimodal Action-in-Interaction Dataset (AID) composed of 1031 action instances performed by 20 subjects, covering 10 categories
- **(During the internship at Tencent Robotics X from 06/2019 to 08/2019)** Proposed a PAPNet with pre-attention to focus on the interactor for efficient pose estimation, achieving 112 fps at 640 × 480 RGBD input on Xavier
- Proposed an AGANet for accurate and explainable skeleton-based action recognition, reaching 95% accuracy on our AID

My contributions: dataset construction; implementation of PAPNet; system deployment; paper, patent writing

SKILLS

- **Programming Language:** Python (fluent), Matlab (familiar)
- **Deep Learning Framework:** Pytorch / TensorFlow 1.x / Keras
- **English:** TOEFL 103 (S 22, W 27)