Internship Application - SiChuan University - Jingtong Yue

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Education:

Organization : Sichuan University
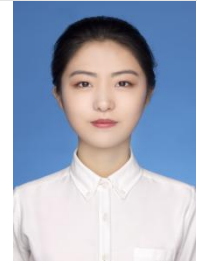
Degree : undergraduate(the third year)

Major : Communication Engineering(Outstanding Engineers' Class)/EE

GPA of all subjects : 3.86/4.0

Rank : 2/30

IELTS : 7.0

Homepage :   Jingtong Yue (jingtong0527.github.io)

Satisfaction of basic requirements

1. I am a junior undergraduate student at Sichuan University studying EE majoring in B-level subject of communication engineering, and I have rich experience in computer vision research by doing scientific researches at the Image Institute of Sichuan University.

2. I have extensive experience in artificial intelligence research, with articles in submission in the field of computer vision and in progress in the field of radar and image multimodal fusion.

3. For the algorithmic innovation and research ability support, please see the Research Experience section. For mathematical reasoning skills, I had taken Calculus 1, Calculus 2 and Linear Algebra courses with scores of 96/100, 96/100, and 97/100.

4. I am fluent in C, C++, Java and python and proficient in the pytorch deep learning framework.

5. In addition to this, I have Android mobile app development skills and neural network mobile porting skills.

Research Experience:

11/2022-12/2023 Unlocking Low-Light-Rainy Image Restoration by Pairwise Degradation Feature Vector Guidance (Submitted to TIP, participate as **a co-first author**.)

Our main contributions in this work include：

1. We propose a parallel network for extracting degradation information of low light rain image.

2. We construct a low-light rain image dataset containing both synthetic and real images

3. We design a semi-supervised framework based on Degradation Representation Learning. It can train both synthetic and real images by contrast learning.

07/2023-04/2023 Dual-Representation Image Quality Assessment (Submitted to ACMMM 2024, participate as **first author**.)

Previous IQA approach focusing extensively on quality information but overlooking the crucial role of degradation information in quality assessment. Nevertheless, image quality is closely related to the degradation information of the image. To address this, we propose the Dual-Representation Interaction (DRI) methods to synchronously extract degradation representations and quality representations of images by one encoder and implicitly interact between the two types of representations.Our main contributions in this work include:

1.We are the first to propose the DRI method to obtain representation vectors with different attributes that promote each other by means of potential interactions, modeling degradation information and quality information of degraded images, respectively;

2.We design the trainable Representation-based Semantic Loss to assist in enhancing the acquisition of degraded quality representations as well as the effective interactions between the representations;

3.We demonstrate the effectiveness of implicit information between different channels of the representations and the correlation between the restoration task and the image quality evaluation task.

11/2023-12/2023 APP development, neural network mobile porting

In the competition I designed an Android mobile app for image restoration in a variety of situations, in which I ported a lightweight Super-Resolution network to mobile in an int8 quantization. In addition to

this, the app also has functions such as object detection (YOLO), crack restoration, de-noising, etc., and has been tested to have good performance in real images.

02/2024-today Radar-Camera Fusion 3D Detection Guided by Weather Quality Representation(under experiment)

To meet the safety requirements of autonomous driving, it is crucial to accurately detect obstacles of all scales. However, almost all existing purely image-based networks exhibit shortcomings in detection tasks under degraded weather conditions. Therefore, we propose a 3D Representation guided Radar-Camera Fusion detection method (3D-RRCF) that combines camera and millimeter-wave radar signal features guided by weather degradation representation. Our main contributions in this work include:

1. We propose a weather degradation representation-guided feature fusion 3D detection method for depth fusion of radar and visual signals.
2. We design a fusion parameter learning module to better adapt to varying degrees of adverse weather and enhance the model's generalization ability.

Future Work:

I am passionate about computer vision and robotic and also planning to go abroad to pursue a master's degree in robotics in 2025.

Awards & Honors:

Second Prize of Electronic Science and Technology Innovation Competition2023/12

Second Prize in NUS Summer Research Deep Learning and Robotics Project Completion-2023/7

Second Class Scholarship of Sichuan University 2022

Sichuan University Third Class Scholarship 2023

Excellent Student of Sichuan University 2022, 2023

Provincial Project of Sichuan University Students' Innovation and Entrepreneurship Competition (Completed) 2023/10

Silver Prize of Sichuan University Internet Plus Innovation and Entrepreneurship Competition2023/6

Provincial First Prize of National College Students Mathematics Competition2022/5