

Wenyu Zhang

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Education

University of Science and Technology of China

Sep 2019 to present

Computer Science Doctor Student

Anhui Agricultural University

Sep 2014 - Jun 2018

Communication Engineering Bachelor

Research Interest

Graph Neural Network and Computer Vision. As I delved deeper into my studies, I realized that graphs are ubiquitous in the real world. This realization led me to pursue Graph Neural Networks (GNNs) as my primary research focus. My research interests are centered around the intersection of GNNs and Computer Vision.

Perception of Automatic Driving. This topic fascinates me because it combines the power of computer vision and machine learning to create safer and more efficient transportation systems. My research aims to enhance the ability of autonomous vehicles to navigate complex and dynamic environments using image and point cloud-based perception systems.

Research Experience

Pixel-wise Graph Attention Networks For Person Re-identification.

In this study, we propose a novel approach to treating the pixels of an image as nodes in a graph, with their surrounding pixels as neighbors. We introduce an efficient image-to-graph algorithm that converts the image into a graph and applies graph attention networks to extract structural and high-order information adaptively.

PointVector: A Vector Representation In Point Cloud Analysis.

Recent research on point cloud analysis has utilized MLP structures such as PointNeXt to gain insight into point clouds. However, standard MLPs lack the ability to extract local features. To address this issue, we introduce a novel vector-oriented feature aggregation module that enriches feature representation and guides the aggregation of neighboring features.

Project Experience

Text Image Super-Resolution Project - China Merchants Bank

This project aimed at improving the readability of low-resolution text images, we propose an efficient pixel-wise graph attention operator that utilizes the attention mechanism to exploit the correlations among neighboring pixels for optimizing the upsampled image features. It efficiently aggregates the neighbors of each node in the image using a sliding window approach, resulting in a one-order-of-magnitude improvement in both computation speed and memory utilization. During the training phase, we introduced a reconstruction function based on HOG features that focuses on local contour details of the image to generate high-quality super-resolution images. Combining multi-stage training strategies, our model can improve recognition accuracy by 2.6%.

Publications

[1] **Wenyu Zhang**, Qing Ding*, Jian Hu, Yi Ma, Mingzhe Lu. Pixel-wise Graph Attention Networks For Person Re-identification. *The 29th ACM International Conference on Multimedia (ACM MM)*, 2021

[2]Xin Deng, **Wenyu Zhang (Co-first author)**, Qing Ding, Xinming Zhang. PointVector: A Vector Representation In Point Cloud Analysis. *In Proceedings of the IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR)*, 2023

[3] **Wenyu Zhang**, Xin Deng, Baojun Jia, Yifan Chen et al. Robust Scene Text Image Super-Resolution Network. *International Conference on Multimedia Retrieval (ICMR)*, 2023, under review

Summary

I have a strong passion for scientific research and am eager to explore new frontiers. One of my greatest strengths is my perseverance in the face of obstacles, which has been a valuable asset in my academic journey. Throughout my postgraduate studies, I have honed my skills in independent research, collaboration, and practical problem-solving.