

ZHAO YUNPENG

Image Processing Center
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EDUCATION

Beihang University (BUAA)

Beijing, China

B.E. in Aircraft control and Information Engineering

Sept. 2018 – Jun. 2022

- **GPA:** 3.6/4.0, 88.4/100 (Rank: 9/46); admitted on basis of performance on national college admissions exam (top 0.1%).
- **Relevant courses:** Mathematical Analysis (91), Data Structure (90), Probability and Statistic (95), Machine Learning (97), Computer Vision (93), Digital Image Processing (94).
- **Research interests:** Medical Image Analysis, Computer Vision, Machine Learning.

PUBLICATION

Yunpeng Zhao, Fugen Zhou, Bin Guo, Bo Liu. “Interpretable Spatial Temporal Graph Convolutional Network with Self-learned Graph Structure for Early MCI Detection” *International Conference on Bioinformatics and Biomedicine (BIBM)*, 2022. (Under Review)

RESEARCH AND WORK EXPERIENCES

Beihang University (Department of Image Processing Center)

Beijing, China

Supervised by Professor Liu Bo

Sept. 2021 – Present

Interpretable Spatial Temporal Graph Convolutional Network with Self-learned Graph Structure for Early MCI Detection

- We proposed an interpretable spatial temporal graph convolutional network with a novel self-learned graph structure mechanism for EMCI detection.
- With the elaborately designed self-learned graph structure technique, our model is able to explore the effective topological structure by automatically refining edge weights.
- Our method outperforms several state-of-the-art approaches on the Alzheimer’s Disease Neuroimaging Initiative (ADNI) dataset, demonstrating the feasibility and effectiveness of using preprocessed BOLD signals as the input feature for EMCI detection.
- Biomarkers consistent with previous neuroscience studies can be extracted from the model, proving the reliable interpretability of our method.

Beihang University (Department of Image Processing Center)

Beijing, China

Supervised by Professor Liu Bo

Jan. 2022 – May 2022

Bachelor Thesis: A Weakly-Supervised Image Classification Framework Based on Graph Convolutional Networks

- A feasible framework based on graph convolutional networks (GCN) for weakly supervised image classification is built, including deep feature extraction, graph construction, and weakly supervised graph convolutional networks.
- Considering a single image as a vertex, autoencoder and SimCLR are employed to extract discriminative node features. Then two similarity-based strategies for adjacency matrix construction are designed.
- Initial residual connection and identity mapping methods are injected into SelfSAGCN, a model for weakly-supervised node classification, to ease the over-smoothing problem and improve its performance.
- The framework achieves better performance on CIFAR-10 and STL-10 datasets, compared with existing weakly-supervised image classification models based on GCNs.

Beihang University & Zhejiang Future Technology Institute

Zhejiang, China

Summer Research Intern

July 2021 – Sept. 2021

Punctate Highlight Removal for Microscopic Images Based on Pix2pixHD

- Designed a framework based on pix2pixHD to remove punctate highlights in microscopic images.
- Proposed a microscopic image dataset consisting of 7500 microscopic images in the size of 256×256 with punctate highlights and 7500 corresponding images without highlights.
- We combine the traditional method of highlight removal with the deep learning model pix2pixHD. The traditional method is employed to generate a binary mask indicating the approximate highlight area as the priori information. Then the mask is concatenated with the 3-channel highlighted microscopic image as the input of the generator.
- Our model is trained by calculating a weighted GAN loss to achieve a better performance of highlight removal. Specifically, we simply increase the weight of loss of highlighted pixels according to the binary mask.

Beihang University

Beijing, China

Teaching Assistant

March 2021 – June 2021

- Grade homework of undergraduates and design quizzes

SELECTED AWARDS AND HONORS

- Rank 2 in ISPRS Benchmark on Object Detection in High-Resolution Satellite Images (top 1% worldwide) 2022
- Outstanding Summer Intern of Beihang University and Zhejiang Future Technology Institute 2021
- Best Project in Summer Internship of Beihang University and Zhejiang Future Technology Institute 2021
- The first Prize of Beihang Academic Competition Scholarship 2020
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ADDITIONAL INFORMATION

Programming	C/C++, Python, Pytorch, LATEX, Matlab, OpenCV
English	TOEFL 96, S22