ZHAO YUNPENG

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EDUCATION

Beihang University (BUAA) Beijing, China
B.E. in Aircraft Control and Information Engineering *Sept. 2018 – Jun. 2022*

- **GPA:** 88.44/100 (Rank: 9/46); Major GPA: 90.26/100 (Rank: 6/46); admitted on performance in 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. "Spatial Temporal Graph Convolution with Graph Structure Self-learning for Early MCI Detection" *International Symposium on Biomedical Imaging (ISBI)*, 2023. **(Submitted)**

RESEARCH AND WORK EXPERIENCE

Beihang University (Department of Image Processing Center) Beijing, China
Supervised by Professor Bo Liu *Sept. 2021 – Present*

Spatial Temporal Graph Convolution with Graph Structure Self-learning for Early MCI Detection

- We proposed a spatial temporal graph convolutional network with a novel graph structure self-learning mechanism for EMCI detection. Our model outperforms several state-of-the-art methods on the ADNI database.
- Our model directly exploits BOLD time series as input features by excavating spatial temporal dependencies in signals, which provides a new perspective for rsfMRI-based preclinical AD diagnosis.
- With the elaborately designed graph structure self-learning technique, our model can adaptively learn the optimal spatial dependency structure in the brain and refine connection weights.
- EMCI-contributory brain regions consistent with previous neuroscience literature can be extracted as biomarkers, proving the credible interpretability of our method.

Beihang University (Department of Image Processing Center) Beijing, China
Supervised by Professor Bo Liu *Jan. 2022 – May 2022*

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

- Design a feasible framework for weakly supervised image classification based on graph convolutional networks.
- Autoencoder and SimCLR are employed to extract discriminative image features as node features. Then two similarity-based strategies for adjacency matrix construction are designed to generate edges.
- 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 the performance.
- The framework achieves better performance on CIFAR-10 and STL-10 datasets, compared with existing GCN-based models for weakly-supervised image classification.

Beihang University & Zhejiang Future Technology Institute Zhejiang, China
Summer Research Intern *July 2021 – Sept. 2021*

Punctate Highlight Removal for Microscopic Images Based on Pix2pixHD

- Design a framework based on pix2pixHD to remove punctate highlights in microscopic images.
- Propose 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 adopt a traditional method of highlight removal to generate a binary mask indicating the approximate highlight area for each microscopic image. Then the mask is used to calculate a weighted GAN loss for better performance.

Beihang University Beijing, China
Teaching Assistant *March 2021 – June 2021*

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
- Beihang Scholarship for Academic Competition (First Prize) 2020

ADDITIONAL INFORMATION

Programming C/C++, Python, Pytorch, LaTeX, MATLAB, OpenCV