

CHENGXING LIN

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EDUCATION

Guangdong University of Technology (GDUT)

Sep 2021 - Present

B.Eng in Computer Science and Technology

GPA: 3.8/5.0

Related courses: Numerical Analysis (Python), Deep Learning

RESEARCH INTERESTS

I am interested in Self-supervised Learning and Vision Language Model.

RESEARCH EXPERIENCE

Research on point cloud self-supervised pre-training [1]

July 2023 - May 2024

Supervisors: Zhu. Jian, and Nie. Yongwei

GDUT

- **Background.** In context of self-supervised pre-training for point clouds, traditional masking strategies, as demonstrated in seminal works like Point-MAE, reveal limitations due to incomplete masking, which restricts the model's ability to learn deeper representations. To overcome this bottleneck, I have delved into novel strategies aimed at enhancing the self-supervised learning capability of models.
- **Contribution.** This research proposes the innovative PatchMixing strategy, which incorporates heterogeneous information to increase pretraining task complexity and enrich representations. Additionally, we introduce a Teacher-Student Model, using the teacher model's output as the supervisory signal for the student model. We develop the PatchMixing Masked Autoencoders (PM-MAE) with multiple branches: two for generating supervisory signals from original and mixed point clouds, and one for the student model focusing on object representation extraction. Extensive experiments and ablation studies validate PM-MAE's effectiveness, achieving 89.8% accuracy on the ScanObjectNN PB-T50-RS split, outperforming Point-MAE by 4.4%.

ACHIEVEMENTS

Second-class Scholarship, awarded by Guangdong University of Technology

Summer 2022

CUMCM, Guangdong Province Second Prize, Topic C

Winter 2022

CUMCM, Guangdong Province Third Prize, Topic A

Winter 2023

Excellent College Student, awarded by Shenzhen Institute for Advanced Study, UESTC

July 2024

Provincial Third Prize in RAICOM CAIP

July 2024

SKILLS

Programming Languages Python, C/C++

Machine Learning Tools Pytorch, Sklearn, Pandas, Numpy, Matplotlib

PUBLICATIONS

- [1] **Lin, Chengxing**, W. Xu, J. Zhu, Y. Nie, R. Cai, and X. Xu, "Patchmixing masked autoencoders for 3d point cloud self-supervised learning," *IEEE Transactions on Circuits and Systems for Video Technology (Early Access)*, 2024.