Curriculum Vitae

Header

Name: Xiangyu Ma

Place of Birth: Zhumadian, Henan

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Date of Birth： August 1998

Number： 16638125473

English： CET-6(431)

Education

- September 2017 - June 2021 | B.Sc.

    School: Zhengzhou University of Light Industry

    Major: Network Engineering

- September 2022 - January 2025 | M.Sc.

    School: North Minzu University

    Major: Artificial Intelligence

Research Experience

- September 2022 - January 2025

    Research Position: Master's Student

    Advisor: Professor Jing Bai

    Laboratory Name: the Key Laboratory of Images Processing and Pattern Recognition Laboratory

    Research Areas: 3D Model Recognition, Sketch-based 3D Model Retrieval, Zero-shot 3D Model Recognition

Publications

Under Review:

- Xiangyu Ma, Jing Bai, Zenghui Su. CMI-Net: Cross-view Message Token Interaction Network for 3D Shape Recognition. lEEE Transactions on Multimedia.(SCI Q1)

- Xiangyu Ma, Jinzhe Jiang, Jing bai. C2DFL: Cross-view Cross-layer Discriminative Feature Learning for Fine-Grained 3D shape Classification. Neural Computing and Applications.(SCI Q2)

- Xiangyu Ma, Jing Bai, Jinzhe Jiang, Bin Peng. Glance and Gaze: Progressive end-to-end deep learning for fine-grained 3D shape classification. Expert Systems with Applications.(SCI Q1)

- Xiangyu Ma, Jing Bai, Jinzhe Jiang, Bin Peng. FG3DFormer: Fine-Grained 3D Shape Classification Based on Vision Transformer. ICASSP.(CCF-B)

- Xiangyu Ma, Jing Bai, Zenghui Su. PVSTrans: Patch-View-Shape Progressive Interaction Transformer for 3D Shape Recognition. IEEE Transactions on Circuits and Systems for Video Technology.(SCI Q1)

Accept:

- 马向宇, 白静, 郑虎, 苏增辉. 基于跨视图信息交互的细粒度三维模型分类. 计算机辅助设计与图形学学报(CCF-A 中文期刊).2024.

- 苏增辉, 马向宇, 白静, 林淦. 基于层级掩码及多尺度特征融合的CAD模型表征. 计算机集成制造系统(EI检索).2024.

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Projects

January 2024 – Present   **Industrial CAD Model Retrieval Engine**   Jialichuang Company

Responsibilities:

1. Collaborated with company stakeholders to define project requirements and authored a project requirements report.

2. Developed a solution for large-scale 3D model retrieval based on input 3D models, images, colors, and dimensions.

Key Achievements:

- 3D Model Retrieval:

  1. Preprocessed input 3D model formats for initial compression and conversion, creating multi-view representations.
  2. Designed a cross-view information interaction-based visual Transformer network to extract view features, achieving a 95% retrieval accuracy by aggregating rich 3D shape descriptors through a multi-granularity feature fusion approach.

- Image-Based 3D Model Retrieval:

  1. Developed a heterogeneous network combining CNN and visual Transformer for shared semantic embedding to mitigate modality differences.
  2. Extracted feature descriptors for images and 3D models separately, calculating distances using cosine similarity for retrieval results.

- Dimension-Based Retrieval:

  Utilized compact bounding boxes to obtain 3D model dimensions, sorted length, width, and height, and implemented Euclidean distance for retrieval.

- Color-Based Retrieval:

  Initially extracted color information from 3D models in formats such as STEP that contain color data, mapped colors to 48 color blocks, and generated a histogram representing the proportion of each block. Calculated distances between 48-dimensional vectors using cosine similarity to return retrieval results.

April 2023 – April 2024   **Research on Fine-Grained 3D Model Classification**   Innovation Project

Research Focus:

Fine-grained 3D model classification has broad applications in fields such as autonomous driving and industrial manufacturing. Traditional classification methods experience significant performance drops when directly applied in these contexts. Our research focused on achieving high-performance classification using only class labels.

Key Achievements:

Addressed limitations in traditional fine-grained 3D model classification research by proposing an effective fine-grained and meta-category 3D model classification method, achieving outstanding performance on benchmark datasets in this field. The project is now successfully completed.

Skills

- Solid programming foundation, proficient in Python and C programming languages, skilled in using the PyTorch open-source framework; experienced with tools such as VS Code and Visio.

- Proficient in language models including Transformer, BERT, and GPT; knowledgeable in vision models such as Vision Transformer and CNN; experienced with the CLIP text-image pretraining model and generative models like GAN and VAE.