```
DiffAssemble-release Test Record
            1. reference
              article link: https://eur01.safelinks.protection.outlook.com/?
                 url=https%3A%2F%2Farxiv.org%2Fabs%2F2402.19302&data=05%7C02%7Cyanxia.lang%40durham.ac.uk%7C98a7a541f83e4d330a2308dd6d21290b%7C7250d88b4b684529be44d59a2d8a6f
              • github link: https://github.com/IIT-PAVIS/DiffAssemble
            2. DiffAssemble structure
              puzzle_diff/train_script.py
                    .dataset
                         dataset.dataset_utils
                              breakingbad_dt.py
                              celeba_dt.py

    CelebA_HQ

                              nips_dt.py
                                   Nips_dt
                              objects_dataset.py

    Objects_Dataset

                              puzzle_dataset.py
                                   Puzzle_Dataset
                                   Puzzle_Dataset_MP
                                   Puzzle_Dataset_Pad
                                   Puzzle_Dataset_ROT
                                   Puzzle_Dataset_ROT_MP
                                   generate_random_expander
                              roc_dt.py
                                   Roc_dt
                              sind_dt.py
                                   Sind_dt
                              sind_vist_dt.py
                                   Sind_Vist_dt
                              text_dataset.py
                                   Text_dataset
                              vist_dataset.py
                                   Vist_dataset
                              wiki_dt.py
                                   Wiki_dt
                              wikiart_dt.py
                                   Wikiart_DT
                    .model
                         spatial_diffusion_on_angle.py
                              .backbones
                                   darknet_TransfConv.py
                                        Dark_TFConv
                                   init.py
                                   efficient_gat.py
                                        Eff_GAT
                                   exophormer_gnn.py
                                        Exophormer_GNN
                    ../.dataset
                         data_splits
                              wikiart_subset_train.txt
            3. git code install on NCC
            using ncc terminal
              • platform: NCC COMP52715 Jupyter Server
              install code:
                    windows: open command -> Win+R -> input "cmd"
                   Mac/Linux: open terminal -> command + space -> input "Terminal"
                    folder upload: scp -r DiffAssemble-release remote-path
            2. DiffAssemble trainning
            i. preparation
              python version:
                    command:
                         python --version -> Python 2.7.18
                         python3 --version -> Python 3.8.10
                         reference: https://www.pythonpool.com/how-to-check-python-version/
                    notebook code:
In [9]: ! python --version
             ! python3 --version
            import sys
            print(sys.version)
            import platform
            print(platform.python_version())
           Python 2.7.18
           Python 3.8.10
           3.11.11 (main, Dec 4 2024, 08:55:08) [GCC 9.4.0]
           3.11.11
              python script run :
                    terminal:

    cd DiffAssemble-release/DiffAssemble-release/puzzle_diff

    python train_script.py

                              o error:

    SyntaxError: invalid syntax -> File "train_script.py", line 188

                       experiment_name = f"{dataset}-{puzzle_sizes}-{steps}-degree:{degree}-virtnode:{virt_nodes}-{get_random_string(6)}-{'discrete' if discrete else 'continuous'}-{'random_dropout' if
                       random_dropout else 'ours_dropout'}-arch-{architecture}" - fstring = f"" supported by python version > 3.6
                         python3 train_script.py
                              o error:

    ModuleNotFoundError: No module named 'torch_geometric': File "train_script.py", line 5, in import torch_geometric

                                   pip install torch_geometric

    ModuleNotFoundError: No module named 'torch'

    pip install torch

    ModuleNotFoundError: No module named 'pytorch_lightning'

                                   pip install pytorch_lightning

    AttributeError: module 'numpy' has no attribute 'typeDict'

                                        • introduced in numpy version 1.0.0, deprecated in numpy version 1.20.0, removed numpy in version 1.24.0

    numpy.typedict didn't provide efficient results with structured arrays, subarrays and other such numpy features.

    numpy.sctypeDict has been introduced as an alternative to the typedict attribute.

    reference: https://www.pythonpool.com/fixed-module-numpy-has-no-attribute-typedict/

                                        o check numpy version: - only show numpy: pip show numpy -> Name: numpy Version: 1.24.4 - show all python packages: pip list - using python code
In [1]: import numpy
            print(numpy.__version__)
          1.26.3
                        - scipy old version caused:
                           - upgrade version: python3 -m pip install --upgrade scipy => version 1.3.3 -> 1.10.1
                        error caused by import dataset_utils
                           ModuleNotFoundError: No module named 'torchvision'
                           - pip install torchvision
                           - error caused by import breakingbad_dt
                              ModuleNotFoundError: No module named 'trimesh'
                              - pip install trimesh => 4.6.13
                           - error caused by import objects_dataset
                              ModuleNotFoundError: No module named 'einops'
                              - pip install einops => 0.8.1
                              - ImportError: cannot import name 'Resampling' from 'PIL.Image'
                                 - supported by pillow version > 9.0.0
                                 - upgrade version: python3 -m pip install --upgrade pillow => version 7.0.0 -> 10.4.0
                           - error caused by import wiki_dt
In [7]: from PIL import Image
            from PIL.Image import Resampling
            print(Image.__version__)
            print(Resampling.__version__)
           10.2.0
                                                                        Traceback (most recent call last)
           AttributeError
           <ipython-input-7-a98ba6f89d74> in <module>
                   4 print(Image.__version__)
           ---> 5 print(Resampling.__version__)
           /usr/lib/python3.11/enum.py in __getattr__(cls, name)
                780
                781
                                  if _is_dunder(name):
                                        raise AttributeError(name)
           --> 782
                783
                                  try:
                                        return cls._member_map_[name]
                784
          AttributeError: __version__
                           - error caused by import wiki dt
                              ModuleNotFoundError: No module named 'pandas'
                              - pip install pandas => 2.0.3
                              - ModuleNotFoundError: No module named 'sklearn'
                              - pip install sklearn
                                 - The 'sklearn' PyPI package is deprecated, use 'scikit-learn'
                                 - pip install scikit-learn => 1.3.2
                        - TypeError: 'type' object is not subscriptable
                           - supported by python version >= 3.9
                           - python3.9 train_script.py - python3.12 train_script.py
                              - ModuleNotFoundError: No module named 'torch geometric'
                              - pip -V
                                 - pip 20.0.2 from /usr/lib/python3/dist-packages/pip (python 3.8)
                                 - default link to python3.8
                              - python3.9 -m pip install torch_geometric
                              - !!! different python versions cannot share the modules

    the usage of the virtual environment

                    benefits:

    shared modules

    only pure python modulels available to share with different python version

    source code open and read directly

    file extension: only contain .py file

    python modules compiled for a specific version

                                   file extension: .dll .so .pyd etc
                                   e.g.1 NumPy - C code,

    e.g.2 panda - depend on NumPy and Cython

                                   • e.g.3 SciPy - Built on top of NumPy with C/C++ and Fortran code
                                   • e.g.4 scikit-learn - Uses Cython and compiled C/C++ for performance.

    e.g.5 TensorFlow - Core engine is in C++ with Python bindings

    e.g.6 PyTorch - Backend is C++ (ATen) with Python interface.

    environmants copied

    different projects supported by different version of modules or python

                    create virtual environment
                         python3 -m venv venv
                         o python -m venv venv
                              unavailable for python version 2
                    enter virtual environment

    linux or macOS: source venv/bin/activate

                         windows: venv\Scripts\activate
                    copy environment
                         pip freeze > requirements.txt

    pip install -r requirements.txt

                    exit environment
                         deactivate
                    delete environment
                         linux or macOS: rm -rf env_name
                         windows: rmdir /s /q env_name

    module download and install

                    .whl file:
                         binary package

    ZIP archive including:

                              python code (.py)
                              compiled extensions (.pyd, .so)

    metadata (METADATA, RECORD, etc.)

                        e.g. numpy-1.25.0-cp311-cp311-win_amd64.whl
                              numpy version 1.25.0

    built for CPython 3.11

                              windows 64-bit
                         advantages:
                              faster installation:
                                   • fast to install without compile from source
                              platform-specific:

    tailored for Windows, macOS, Linux, and specific Python versions

                              offline installation:

    download and install without internet access.

                    install modules depended

    python3.12 virtual environment test

                    python3.12 -m venv venv312
                    source venv312/bin/activate
                    python --version -> 3.12.9
                    python train_script.py
                         o error:

    ModuleNotFoundError: No module named 'torch_geometric'

    pip install torch_geometric -> 2.6.1

    ModuleNotFoundError: No module named 'torch'

                         pip install torch -> 2.7.1

    ModuleNotFoundError: No module named 'pytorch_lightning'

                         pip install pytorch_lightning -> 2.5.2

    ModuleNotFoundError: No module named 'torchvision'

    pip install torchvision -> 0.22.1

    ModuleNotFoundError: No module named 'trimesh'

                         pip install trimesh -> 4.6.13

    ModuleNotFoundError: No module named 'scipy'

                         pip install scipy -> 1.16.0
                         ModuleNotFoundError: No module named 'einops'
                         pip install einops -> 0.8.1

    ModuleNotFoundError: No module named 'matplotlib'

    pip install matplotlib -> 3.10.3

    ModuleNotFoundError: No module named 'pandas'

                         pip install pandas -> 2.3.0

    ModuleNotFoundError: No module named 'sklearn'

    pip install scikit-learn -> 1.7.0

    ModuleNotFoundError: No module named 'timm'

                         pip install timm -> 1.0.16

    ModuleNotFoundError: No module named 'kornia'

                         pip install kornia -> 0.8.1

    ModuleNotFoundError: No module named 'transformers'

    pip install transformers -> 4.53.1

    ModuleNotFoundError: No module named 'wandb'

                         pip install wandb -> 0.21.0

    ModuleNotFoundError: No module named 'model.backbones.backbone_vist'

                              no backbone_vist.py find -> comment code

    ModuleNotFoundError: No module named 'torch_scatter'

                         pip install torch_scatter

    Using cached torch_scatter-2.1.2.tar.gz (108 kB)

    Installing build dependencies ... done

    Getting requirements to build wheel ... error

                                        • File "/tmp/pip-build-env-ud0ncm91/overlay/lib/python3.12/site-packages/setuptools/build_meta.py", line 317, in run_setup
                            exec(code, locals())
                            - ModuleNotFoundError: No module named 'torch'

    check torch version

                                   python
                                   import torch
                                   print(torch.version)
                                   o 2.7.1 + cu126
                                   exit -> contrl+D
                              • pip install torch-scatter -f https://data.pyg.org/whl/torch-2.7.1+cu126.html
                                   • the lastest verison supports 2.7.0, 2.7.1 not found

    build torch-scatter from source

                                        o pip install setuptools wheel ninja cmake -> wheel-0.45.1,ninja-1.11.1.4,cmake-4.0.3
                                        git clone https://github.com/rusty1s/pytorch_scatter.git
                                        cd pytorch_scatter

    pip install . -> 2.1.2

    ModuleNotFoundError: No module named 'pytorch3d'

                         pip install pytorch3d
                              • the lastest version supports pytorch 2.1.0, 2.7.1 not found

    rebuild from source because of no prebuilt wheels

                                   • git clone https://github.com/facebookresearch/pytorch3d.git
                                   cd pytorch3d

    pip install . -> 0.7.8

    FileNotFoundError: [Errno 2] No such file or directory: 'datasets/data_splits/wikiart_subset_train.txt'

                              puzzle_diff/train_script.py", line 114, in main
                                   train_dt, test_dt, puzzle_sizes = du.get_dataset
                              puzzle_diff/dataset/dataset_utils.py", line 74, in get_dataset
                                   • train_dt = Wikiart_DT(train=True)
                              puzzle_diff/dataset/wikiart_dt.py - line 18, in init
                                   with open(train_file, "r") as f:
                              o cd ../
              python puzzle_diff/train_script.py

    jupyter notebook: path-same root with puzzle_diff

                    code:
In [ ]: %run puzzle_diff/train_script.py
                   - error:
                      - No module named 'torch_geometric'
                   - code: pip install torch_geometric
                   - error:
                      - Permission denied
In [2]: import pytorch_lightning as pl
In [6]:
           Python 3.8.10
            aiohappyeyeballs 2.4.4 aiohttp 3.10.11 aiosignal 1.3.1 appdirs 1.4.3 async-timeout 5.0.1 attrs 19.3.0 Automat 0.8.0 blessings 1.7 blinker 1.4 certifi 2019.11.28 chardet 3.0.4 Click 7.0 cloud-init 24.4.1
            ClusterShell 1.8.3 colorama 0.4.3 command-not-found 0.3 configobj 5.0.6 constantly 15.1.0 cryptography 2.8 cupshelpers 1.0 cycler 0.10.0 dbus-python 1.2.16 decorator 4.4.2 defer 1.0.6 distlib 0.3.0
            distro 1.4.0 distro-info 0.23+ubuntu1.1 einops 0.8.1 entrypoints 0.3 filelock 3.0.12 frozenlist 1.5.0 fsspec 2025.3.0 GDAL 3.0.4 gpustat 0.4.1 greenlet 0.4.15 httplib2 0.14.0 hyperlink 19.0.0 idna 2.8
            importlib-metadata 1.5.0 incremental 16.10.1 iotop 0.6 Jinja2 2.10.1 jsonpatch 1.22 jsonpointer 2.0 jsonschema 3.2.0 keyring 18.0.1 kiwisolver 1.0.1 language-selector 0.1 launchpadlib 1.10.13
            lazr.restfulclient 0.14.2 lazr.uri 1.0.3 lightning-utilities 0.11.9 macaroonbakery 1.3.1 Mako 1.1.0 Markdown 3.1.1 MarkupSafe 1.1.0 matplotlib 3.1.2 more-itertools 4.2.0 mpmath 1.3.0 msgpack 0.6.2
            multidict 6.1.0 netifaces 0.10.4 networkx 3.1 numpy 1.24.4 nvidia-cublas-cu12 12.1.3.1 nvidia-cuda-cupti-cu12 12.1.105 nvidia-cuda-nvrtc-cu12 12.1.105 nvidia-cuda-runtime-cu12 12.1.105 nvidia-cuda-runtime-cu12 12.1.105 nvidia-cuda-nvrtc-cu12 12.1.105 nvidia-cuda-nvrtc-cu12 12.1.105 nvidia-cuda-runtime-cu12 12.1.105 nvidia-cuda-nvrtc-cu12 12.1.105 nvidia-nvrtc-cu12 12.1.1
            cudnn-cu12 9.1.0.70 nvidia-cufft-cu12 11.0.2.54 nvidia-curand-cu12 10.3.2.106 nvidia-cusolver-cu12 11.4.5.107 nvidia-cusparse-cu12 12.1.0.106 nvidia-ml-py 7.352.0 nvidia-ml-py 3.7.352.0 nvidia-ml-py 7.352.0 nvidia-ml-py 3.7.352.0 nvidia-cusparse-cu12 12.1.0.106 nvidia-cusparse-cu12 12.1.0.106 nvidia-ml-py 7.352.0 nvidia-ml-py 3.7.352.0 nvidia-cusparse-cu12 12.1.0.106 nvidia-cuspa
            nccl-cu12 2.20.5 nvidia-nvjitlink-cu12 12.9.86 nvidia-nvtx-cu12 12.1.105 oauthlib 3.1.0 olefile 0.46 packaging 20.3 pexpect 4.6.0 Pillow 7.0.0 pip 20.0.2 proposache 0.2.0 protobuf 3.6.1 psutil 5.9.0
            pyasn1 0.4.2 pyasn1-modules 0.2.1 pycairo 1.16.2 pycups 1.9.73 Pygments 2.3.1 PyGObject 3.36.0 PyHamcrest 1.9.0 PyJWT 1.7.1 pymacaroons 0.13.0 PyNaCl 1.3.0 pynvim 0.4.1 pyOpenSSL 19.0.0
            pyparsing 2.4.6 pyRFC3339 1.1 pyrsistent 0.15.5 pyserial 3.4 python-apt 2.0.1+ubuntu0.20.4.1 python-dateutil 2.7.3 python-debian 0.1.36+ubuntu1.1 pytorch-lightning 2.4.0 pytz 2019.3 PyYAML 6.0.2
            requests 2.22.0 requests-unixsocket 0.2.0 scipy 1.10.1 screen-resolution-extra 0.0.0 SecretStorage 2.3.1 service-identity 18.1.0 setuptools 45.2.0 simplejson 3.16.0 six 1.14.0 sos 4.7.2 ssh-import-id
```

5.10 sympy 1.13.3 systemd-python 234 torch 2.4.1 torch-geometric 2.6.1 torchmetrics 1.5.2 torchvision 0.19.1 tgdm 4.67.1 trimesh 4.6.13 triton 3.0.0 Twisted 18.9.0 typing-extensions 4.13.2 ubuntu-

pro-client 8001 ufw 0.36 unattended-upgrades 0.1 urllib3 1.25.8 virtualenv 20.0.17 wadllib 1.3.3 wheel 0.34.2 xkit 0.0.0 yarl 1.15.2 zipp 1.0.0 zope.interface 4.7.1

LoG Book