**Registration Benchmark download\_data.py Manual**

1. Program Overview

download\_data.py is a Python script developed to automate the process of downloading and extracting datasets from the ETH and SUN3D sources.

The script performs the following functions:

* Downloads ZIP archives of the specified datasets from given URLs.
* Extracts the contents of each ZIP archive into its respective dataset directory.
* For SUN3D datasets, it also downloads and manages the evaluation datasets.

2. Function Descriptions

download\_and\_extract\_ETH\_datasets(datasets, root\_dir)

This function downloads and extracts the ETH datasets.

Parameters:

* datasets: A list of lists, where each sublist contains the name and URL of a dataset to be downloaded.
* root\_dir: The root directory where the datasets will be downloaded and extracted.

download\_and\_extract\_SUN3D\_datasets(datasets, root\_dir)

This function downloads and extracts the SUN3D datasets. After extraction, it moves files from an additional directory level to the main dataset directory, then removes the now empty directory.

Parameters:

* datasets: A list of lists, where each sublist contains the name and URL of a dataset to be downloaded.
* root\_dir: The root directory where the datasets will be downloaded and extracted.

download\_and\_extract\_SUN3D\_eval\_datasets(datasets, root\_dir)

This function downloads and extracts the SUN3D evaluation datasets. After extraction, it moves the 'gt.log' file to the respective main dataset directory, removes all other files from the evaluation dataset directory, and then removes the evaluation dataset directory if it is empty.

Parameters:

* datasets: A list of lists, where each sublist contains the name and URL of an evaluation dataset to be downloaded.
* root\_dir: The root directory where the datasets will be downloaded and extracted.

main()

This is the main function that is called when the script is run. It sets the datasets to be downloaded and the directories where they will be stored, then calls the above functions to download and extract the datasets. If you want to download and extract different datasets, you would modify this function with the appropriate dataset names and URLs.

3. Imports and Dependencies

The script requires Python 3, and uses the following libraries:

* os: Used for creating directories and handling paths.
* requests: Used to send HTTP requests to download data.
* zipfile: Used to extract downloaded ZIP files.
* shutil: Used to handle operations such as moving and removing files and directories.

4. Operation/Usage

Run the Python script using a Python interpreter. For example, if you have Python installed and set up in your PATH, you can use the following command in the terminal:

python download\_data.py

1. The script will then download the specified datasets one by one. If a dataset has already been downloaded and its ZIP file is still in its directory, the script will skip the download for that dataset.
2. The script will extract each downloaded dataset into its respective directory.
3. For SUN3D datasets, after the main dataset is downloaded and extracted, the corresponding evaluation dataset is also downloaded, extracted, and managed.
   * The ground truth log file ('gt.log') from the evaluation dataset is moved to the respective main dataset folder.
   * All remaining files in the evaluation dataset folder are removed.
   * If the evaluation dataset folder is empty after this process, it is removed.
4. At the end of the script, all downloaded datasets will be in their respective directories under the 'DATA/ETH' and 'DATA/SUN3D' directories.
5. If you want to download and extract different datasets, you will need to modify the **main** function with the appropriate dataset names and URLs.

5. Output and Interpretation

**Troubleshooting**

* If the script is unable to create directories or download files, check your file system permissions.
* If the script is unable to reach the specified URLs, check your internet connection and verify that the URLs are still valid.

**Disclaimer**

Please respect the terms and conditions of the data sources when using this script. The script is designed for convenience and does not bypass any permissions or restrictions set by the data providers.