

Manual

Here are some instructions on how to use my fairness testing tool. Please be aware that the tool uses techniques like batch processing, dataset caching and parallel processing to speed up the time it takes to run a full experiment. Without this it takes many hours for the experiments to run fully sequentially.

To run a fairness test with default settings (30 runs, 1000 samples) on all datasets:

```
python Fairness_testing_tool.py
```

If you want to change the experiment parameters like runs and evaluation budget, you can do so by changing the values of variables runs and num_samples on lines 1005 and 1006:

```
1004     # Settings for testing
1005     runs = 30
1006     num_samples = 1000
```

If you would like to test a dataset and model of your own, you need to ensure that the dataset is stored in the dataset folder of the workspace and the corresponding model must be stored in the DNN folder. Then you must add a dataset configuration, specifying paths to the dataset and the model as well as sensitive and target columns in the section pictured below:

```
941     # Dataset configurations
942     datasets = [
943         {
944             'name': 'adult',
945             'file_path': 'dataset/processed_adult.csv',
946             'model_path': 'DNN/model_processed_adult.h5',
947             'target_column': 'Class-label',
948             'sensitive_columns': ['gender', 'race', 'age']
949         },
```

When the program finishes running it will output the new results into the results directory, overwriting any files of the same name. If you wish to maintain the results that already exist there, I suggest copying the folder before running the program.

The results generated include:

- A summary report of performance across all datasets as a text file
- Results data from all datasets in csv format (overall_results.csv)
- A figure comparing all results (overall_comparison.png)
- And the following for each dataset:
 - IDI ratio comparison figure
 - Percentile comparison figure
 - Raw results for that dataset in csv format
 - Stats overview for that dataset as a text file