

Replication Instructions

AI Model Fairness Testing

Project Structure

- `dataset/` – Folder containing CSV datasets
- `DNN/` – Folder containing pre-trained model files
- `report_tools/` – Scripts for generating visualisations and running statistical tests used in the report
- `config.py` – Configuration file with dataset and model paths, sensitive feature indices, and target labels
- `genetic.py` – Genetic Algorithm-based fairness testing tool
- `rand.py` – Random Search baseline fairness testing tool
- `main.py` – Shared functions used by `genetic.py` and `rand.py`
- `runner.py` – Script to automate multiple runs used for experiment

Datasets and Models

The datasets and pre-trained models are configured in `config.py` with the following options:

- ADULT
- COMPAS
- LAW_SCHOOL
- KDD
- DUTCH
- CREDIT
- CRIME
- GERMAN

Experiment Method

1. Open `runner.py`.
2. Change which tool to run by editing:

```
result = subprocess.run(["python", "rand.py"], capture_output=True, text=True)
```

Replace `rand.py` with `genetic.py` to run the Genetic Algorithm.
3. Open the corresponding algorithm script you selected (`rand.py` or `genetic.py`).
4. At the bottom of the script, change the dataset argument in:

```
run_fairness_testing("ADULT")
```

Replace `"ADULT"` with any dataset name listed in `config.py`, e.g. `"CRIME"`.
5. Run the experiment script: `python runner.py`
6. Results will be saved in `results.csv`.