Short User Manual for GenoPhysics

Sancho Simões and Tiago Ventura

May 2023

1. **The path to the file containing the problem data (solar_system.txt) is passed as a parameter to the corresponding object of either Tree-Based GP or Grammar-Based GP, using the load_dataset function in main.py.**

2. **In the GP algorithm, after loading the input data from the file, all functions that are on solar_system.txt must be registered in function wrappers. Once the explicit functions are registered, you can run the main.py script to execute the GP algorithm and produce the results. You can run the script multiple times with different hyperparameters to explore the solution space and find the best solution.**

3. **In the GE algorithm, you also need to register the explicit functions in the solar_system.txt file with the function wrappers, as described in step 2. Once the explicit functions are registered, you can run the main.py script to execute the GE algorithm and produce the results. Like with the GP algorithm, you can run the script multiple times with different hyperparameters to optimize the performance of the algorithm.**

4. **To obtain statistical data from the results produced by the GP and GE experiments, you can use the statistical_tests.py script. In this script, you need to modify the gp_data and ge_data variables to match the results produced by the GP and GE algorithms, respectively. Then you can run the script to execute statistical tests and obtain the results, including the mean, standard deviation, and p-value for each algorithm. This will allow you to compare the performance of the two algorithms and determine which one is better suited for the problem at hand.**