Evolutionary computation

Tasks 2024/2025

4 Implementation of selected Evolutionary Algorithm

In this task, you will select and implement an evolutionary algorithm within your current project/framework. The submission must include the source code of your algorithm, and the corresponding article. Your selected algorithm must not be older than 5 years (the publication year must not be earlier than 2019) and must be suitable for continuous single-objective optimization problems.

Guidance for selecting an algorithm:

- Explore journals on evolutionary computation, such as: Applied Soft Computing, IEEE Transactions on Evolutionary Computation, Swarm and Evolutionary Computation, Evolutionary Computation, Natural Computing, Expert Systems with Applications, Soft Computing, or use Google Scholar.
- Keywords for finding a suitable evolutionary algorithm: unconstrained, evolutionary algorithm, single-objective optimization, metaheuristic . . .
- Repository of evolutionary algorithms
- Articles:
  - A Contemporary Systematic Review on Meta-heuristic Optimization Algorithms with Their MATLAB and Python Code Reference
  - A review of nature-inspired algorithms on single-objective optimization problems from 2019 to 2023
  - Performance assessment and exhaustive listing of 500+ nature-inspired metaheuristic algorithms

4.1 Experiment

Similar to the previous tasks, your goal is to execute the algorithm several times across all problems (excluding Bukin and Carrom Table) with dimensions 10, 20, and 30.

For consistency in comparison, you must use the following settings for each problem:

- Perform 50 independent runs.
- Maximum function evaluations: $3000 \times d$
- Use the recommended values for the remaining parameters as specified by the algorithm's authors.

After completing the runs, create a **.txt** file for each problem containing the best results from all 50 runs. Each line should represent the result of one run (the file will consist of 50 lines). Name the files according to this format: **[Algorithm Acronym]-(your surname without special characters)_problem name with the number of dimensions**. For instance, if the algorithm is Artificial Bee Colony, the filename should start with **ABC**, e.g., **ABC-Ravber_SphereD10.txt**. Following the naming convention precisely is mandatory. Submit all **.txt** files in the **results** directory. Note that the **submission deadline** for these files is 3 days before the task deadline.

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* Deadline: **January 14, 2025**.
* The task is **mandatory** and worth **30 points**.