

Assignment 2: Deep Understanding of an Evolutionary Algorithm

1, Overview

The main task of this assignment is to have a deep understanding of evolutionary algorithms. This assignment has 100 marks, which will take 20% in your final mark of this course. The mark you get in this assignment depends on the quality of your review report, and presentation.

2, Task

You will choose an evolutionary algorithm (EA) from the list of following evolutionary algorithms, read papers related to the chosen algorithm, and write a review report on it, so that you can gain more deep understanding of this evolutionary algorithm, therefore more deep understanding of evolutionary algorithms in general. The list of evolutionary algorithms includes

- ✓ Genetic Algorithms
- ✓ Evolutionary Programming
- ✓ Evolution Strategies
- ✓ Genetic Programming
- ✓ Differential Evolution
- ✓ Particle Swarm Optimization
- ✓ Brain Storm Optimization

2.1, Report

A report (in pdf format) must be submitted, named as report.pdf. MSWord and LaTeX templates can be found at <https://www.ieee.org/conferences/publishing/templates.html>. You should use these templates.

The expected structure is given below.

Abstract

Introduction

Background Introduce where and why this evolutionary algorithm originally came from and what problem it was originally designed to solve.

Developmental Line Describe the development timeline of this evolutionary algorithm starting from the very first version of this algorithm to most-up-to-date version of this algorithm. For each version of the algorithm, describe the motivation, the algorithm itself (in flowchart), test problems (including benchmark problems and real-world problems), source codes (if available by providing location/link), and conclusions (its achievements).

Discussions

You should do a comparison among all versions of the algorithm.

Conclusion and Future Research Directions

References

Remark: Please be careful with the grammar, spelling and format.

2.2, Presentation

Examples of evaluation criteria are, but not limited to:

Description of the algorithms: What are they? What are their characteristics? What problems are they designed to solve? ...

Test Problems: How the algorithms are tested? What real-world problems they have been applied to solve?

Comparison and discussion: Advantages and disadvantages of each version of the algorithm, ...

Presentation of the slides: Format, typeset, spelling, grammar, ...

Language and clearness

3, Submission

3.1, What to submit

Report: Each student should submit one single file for the report.

- ✓ A pdf report file named as assignment2-report-studentIDnumber.pdf. Example: assignment2report-12345678.pdf.

Presentation slides Each student should submit one single file for her/his presentation. The submitted file can be of one of the following formats:

- ✓ Assignment2-presentation-studentIDnumber.ppt
- ✓ Assignment2-presentation-studentIDnumber.pptx
- ✓ Assignment2-presentation-studentIDnumber.pdf

3.2, Where to submit

Email your Report and Presentation files to Ms. Honglin Jin (12531321@mail.sustech.edu.cn) and cc Yuhui Shi (shiyh@sustech.edu.cn). The subject of the email should use the format: [CSE5012] Assignment 2 (LastName/FirstName-StudentNumber).

3.3, Important date

Please submit your Report and Presentation files by 10:20 (Beijing time) November 11 (Tuesday), 2025.

Please Note: Late submission will be penalized (25% for each day late)

4, Prohibition

You will get 0 as score for this assignment if any of the following cases happens:

- ✓ You don't respect the naming policy of files.
- ✓ The report/presentation submission is delayed for 3 days (72 hours) or more.
- ✓ Plagiarism.

Contact: For any question regarding this assignment, please email to Ms. Honglin Jin (12531321@mail.sustech.edu.cn). The subject of the email should respect the format: [CSE5012] Assignment 2 (LastName/FirstName-StudentNumber)

Example: [CSE5012] Assignment 2 (Jin/Honglin-12531321)