

# Statements of Individual Contributions

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## Abstract

In this short report we detail each group member's contributions in the completion of the group project that we have chosen. The project involved benchmarking the  $(\mu/\mu^+\lambda) - ES$  algorithm using the COCO platform and compare the results with the results given by other algorithms.

## 1 Individual Contributions to the Group

The success of a group project is largely based on the identification and proper distribution of tasks between all group members. Collecting documentation, understanding the  $(\mu/\mu^+\lambda) - ES$  algorithm and the way the COCO platform benchmarks black-box optimization algorithms was naturally an essential and common task for everyone. However, everyone has made this with the pace set by the task that has been assigned to him. For the final report writing, we divided the tasks once again so that everyone writes, corrects and expands a portion on which he has not worked before. Thus, in the end, everyone has seen the various fronts of the project. Every group member performed a final reading of the report for making eventual corrections and filling gaps.

### 1.1 Abdelhadi Temmar

My contribution to the group project begun by implementing the  $(\mu/\mu^+\lambda) - ES$  algorithm on python. After reading the paper and documentation about integration of the algorithm into the COCO platform. I participated to the writing of the intermediate report especially by adding explanations concerning the algorithm comprehension and implementation. I also implemented the first stopping criteria with the help of Nicolas. The final task that i had to perform was to write the final report conclusion.

### 1.2 Nawel Medjkoune

Interpreting the results effectively being very important in any research project, we decided to consider the comprehension and interpretation of results signification as a separate task requiring a lot of reflection and documentation. So, I proceeded since the beginning to output the first results to performing an analysis in order to debug the algorithm first and to see on which direction to turn our experiments. Naturally, writing the results and discussion part of the intermediate/final report was assigned to me. I also helped by implementing the second termination criteria on the source code of the algorithm.

### 1.3 Nicolas Bougie

The implemented algorithm had to be integrated into the coco platform in order to benchmark it and compare it with other continuous optimization algorithms. So, a good understanding of the COCO platform was necessary. Thus, i collect some documentation concerning COCO and the various parameters (dimension, budget...). I summarized the key points in a presentation that I shared with the group members in order to familiarize them with the COCO platform. I also helped by implementing the first termination criteria on the source code of the algorithm. In the final report, I was focused on the introduction and the algorithm description and comprehension.

## 1.4 Sihem Abdoun

As we have advanced quite early on the project, we wanted our intermediate report to be close in content from the final report. So, I tried to understand the different aspects of the project (The algorithm, the context project, the COCO platform, black-box optimization problems, kinds of experimentation...etc) to draft a plan and determine the exact content of sections and subsections. In the final report, I focused on the Algorithm Implementation and Configuration details' section and the Abstract. When the final report was completed, I reported the contributions of each member in the current paper the most accurately possible. I also performed some experimentation concerning the  $\lambda$  parameter independently from the variations made when the algorithm restarts to see how the algorithm reacts.

## 1.5 Stephen Batifol

I read thorough the article in order to understand the problem well. Because we had to run the experiments for multiple days I ran them on my computer. As everyone in the group, I also wrote some parts of the intermediate and final reports. With a focus on the goals of the project, the remaining work, the further aspects and the conclusion for the intermediate report. For the final report, I was focused on the comparison of the results of our algorithm with the others. I also did multiple readings of the report for corrections.

## 2 Anti-Plagiarism Statement

All group work, be it the source code, the documentation, the report, the presentation, or any other contribution have been solely written by the group members or corresponding reused parts have been cited accordingly. We, the group members, confirm herewith as well that we all have read and understood the "What is plagiarism" page of <http://www.plagiarism.org/plagiarism-101/what-is-plagiarism/>.

### Read and approved

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