

# A Gentle Introduction to the Time Complexity Analysis of Evolutionary Algorithms

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## 1 Abstract

Great advances have been made in recent years towards the runtime complexity analysis of evolutionary algorithms. Much of this progress has been due to the application of techniques from the study of randomised algorithms. The first pieces of work, started in the 90s, were directed towards analysing simple toy problems with significant structures. This work had two main goals. One goal was to understand on which kind of landscapes EAs are efficient, and when they are not. The other goal was to develop the first basis of general mathematical techniques needed to perform the analysis. Thanks to this preliminary work, nowadays, it is possible to analyse the runtime of evolutionary algorithms on different combinatorial optimisation problems. In this beginners' tutorial, we give a basic introduction to the most commonly used techniques, assuming no prior knowledge about time complexity analysis.

## 2 Didactical Materials

The attendees of the tutorial will receive handouts of the slides. The slides will also be available online on the author's webpage:

<http://staffwww.dcs.shef.ac.uk/people/P.Oliveto/>