

THEORY OF EVOLUTIONARY COMPUTATION: INTRODUCTORY TUTORIAL

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Theoretical research has always accompanied the development and analysis of evolutionary algorithms, both by explaining observed phenomena in a very rigorous manner and by creating new ideas. Since the methodology of theory research is very different from experimental or applied research, non-theory researcher occasionally find it hard to understand and profit from theoretical research. Overcoming this gap in our research field is the target of this tutorial. To this aim

- we describe what theory research in EC is, what it aims at, and showcase some of key findings of the last 15 years,
- we discuss the particular strengths and limitations of theory research,
- we show how to read, understand, interpret, and profit from theory results, and
- we give an introduction requiring no preliminary theory exposure to the subfield of runtime analysis, which gives proven performance guarantees for evolutionary algorithms.