

Understanding Evolutionary Algorithms through Interactive Graphical Applications

Authors : Javier Barrachina, Piedad Garrido, Manuel Fogue, Julio A. Sanguesa, Francisco J. Martinez

Abstract : It is very common to observe, especially in Computer Science studies that students have difficulties to correctly understand how some mechanisms based on Artificial Intelligence work. In addition, the scope and limitations of most of these mechanisms are usually presented by professors only in a theoretical way, which does not help students to understand them adequately. In this work, we focus on the problems found when teaching Evolutionary Algorithms (EAs), which imitate the principles of natural evolution, as a method to solve parameter optimization problems. Although this kind of algorithms can be very powerful to solve relatively complex problems, students often have difficulties to understand how they work, and how to apply them to solve problems in real cases. In this paper, we present two interactive graphical applications which have been specially designed with the aim of making Evolutionary Algorithms easy to be understood by students. Specifically, we present: (i) TSPS, an application able to solve the "Traveling Salesman Problem", and (ii) FotEvol, an application able to reconstruct a given image by using Evolution Strategies. The main objective is that students learn how these techniques can be implemented, and the great possibilities they offer.

Keywords : education, evolutionary algorithms, evolution strategies, interactive learning applications

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