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Genetic Algorithm Essentials

Springer

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Abstract

Genetic algorithms (GAs) are biologically inspired methods for optimization. In the last decades, they have grown to exceptionally successful means for solving optimization problems. *Genetic Algorithm Essentials* gives an introduction to Genetic algorithms with an emphasis on an easy understanding of the main concepts, most important algorithms, and state-of-the-art applications. The depiction has three unique characteristics: It does not get lost in unnecessary details, it considers latest developments like machine learning for evolutionary search, and it abstains from an overload of formalisms and notations and thus opens the doors to a broader audience. The first part of this book gives an introduction to Genetic algorithms starting with basic concepts like evolutionary operators. It continues with an overview of strategies for tuning and controlling parameters. The second part is dedicated to solution space variants such as multimodal, constrained, and multi-objective solution spaces. The third part gives a short introduction to theoretical tools for Genetic algorithms, the intersections, and hybridizations with machine learning and shows a choice of interesting applications.