# <<基于种群概率模型的优化技术>>

## 图书基本信息

书名：<<基于种群概率模型的优化技术>>

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## 前言

The study and use of population-based probabilistic modeling techniques for optimization have been successfully developed during the last decade.Among thesete chniques.Genetic algorithms（GAS）and Estimation of Distribution Algorithms（EDAS）have been the reference. This book, comprised of a total of 9 chapters, covers broadly important spectrum subjects ranging from fundamental theories of GAS and EDAS, development of a new type of EDAs and applications of EDAS to efficiency enhancements of EDAs.Inchapter 1, GA fundamentals are discussed. We begin with what is usually the most critical decision in any application, namely that of deciding how best a candidate solution is represented to the algorithm.We then describe variation operators suitablefor different types of representation, before turning our attention to the selection andreplacement mechanisms that are used to manage the populations of solutions.Inchapter 2.the EDAS proposed for the solution of combinatorial optimization problems and optimization in continuous domains are reviewed.Different approaches for EDAS have been ordered by the complexity of interrelations SO that they are able to express.An empirical comparison of EDAS in binary search spaces is covered in chapter 3.Furthermore, techniques of implementations of a new type of EDAS are studied in chapter 4.The experimental results of applying EDAS to some optimization problems are shown in chapter 5.Chapter 6, 7 and 8 bring together some EDAs approaches to optimization problems in the fields of graph matching and resource management.Finally, chapter 9 provides an overview of different efficiency-enhancement techniques for EDAS. This book should be of interested to theoreticians and practitioners alike.and iS a must-have resources for those interested in optimization in general, and genetics and estimation of distribution algorithms in particular.Also engineers who, in their dailylife, face real.

## 内容概要

本书较系统地讨论了遗传算法和分布估计算法的基本理论，并在二进制搜寻空间实验性地比较了几种分布估算法。
在此基础上深入地论述了构建一类新的分布估计算法的思路和实现方法，最后介绍了分布估计算法在计算机科学、资源管理等领域的一些成功应用实例及分布估计算法的几种有效改进方法。

## 书籍目录

## 章节摘录

other non,binary information.For example, we might interpret a bit-string of length 80 as ten 8 bit integers.Usually this is a mistake.and better results can be obtained by using the integer or real-valued representations directly. One of the problems of coding numbers in binary is that different bits have different significance.This Can be helped by using Gray coding, which is a variation on the way that integers are mapped on bit strings.The standard method has the disadvantage that the Hamming distance between two consecutive integers is often not equal to one.If the goal is to evolve an integer number, you would like to have thechance of changing a 7 into an 8 equal to that of changing it to a 6.The chance of changing 0111 to 1000 by independent bit-flips is not the same, however, as that of changing it to 01 10.Gray coding is a representation which ensures that consecutiveintegers always have Hamming distance one. 1.3.2 Integer Representations Binary representations are not always the most suitable if our problem more naturally maps onto a representation where different genes can take one of a setvalues.One obvious example of when this might occur is the problem of finding the optimal values for a set of variables that all take integer values.These values might beunrestricted, or might be restricted to a finite set：for example, if we are trying toevolve a path on square grid, we might restrict the values to the rest{0, 1, 2, 3}representing{North, East, South, West}.In either case an integer encoding isprobably more suitable than a binary encoding.'When designing the encoding andvariation operators, it is worth considering whether there are any natural relationsbetween the possible values that an attribute Can take.This might be obvious forordinal attributes such as integers, but for cardinal attributes such as the compasspoints above , there may not be a natural ordering. 1.3.3 Real-Valued Representations Often the most sensible way to candidate solution to a problem is to have a stringof real values.This occurs when the values that we want to represent as genes comefrom a continuous rather than a discrete distribution.Of course, on a computer theprecision of these real values is actually limited by the implementation.

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