Grouping Genetic Algorithm (GGA)

Group encoding:



The Crossover: the general pattern

a superior		
5, 3 4, 1	6	Child 1: 7, 2 4, 1 5, 3 6
1156	7	Child 1: 2, 5 3, 6 4, 1 7
4, 1 3, 0	/	Cmid 1: [2, 3 3, 6 4, 1 7
	4	5, 3 4, 1 6 4, 1 5, 6 7

The Mutation: eliminate some existing groups; insert the missing items by a problem depended heuristic

Genetic Algorithms And Grouping Problems

Jin-Ying Zhang

Genetic Algorithms And Grouping Problems:

Genetic Algorithms and Grouping Problems Emanuel Falkenauer, 1998-04-22 A reader friendly introduction to the exciting vast potential of Genetic Algorithms The book gives readers a general understanding of the concepts underlying the technology an insight into its perceived benefits and failings and a clear and practical illustration of how optimization problems can be solved more efficiently using Falkenauer's new class of algorithms **Grouping Genetic Algorithms** Michael Mutingi, Charles Mbohwa, 2016-10-04 This book presents advances and innovations in grouping genetic algorithms enriched with new and unique heuristic optimization techniques These algorithms are specially designed for solving industrial grouping problems where system entities are to be partitioned or clustered into efficient groups according to a set of guiding decision criteria Examples of such problems are vehicle routing problems team formation problems timetabling problems assembly line balancing group maintenance planning modular design and task assignment A wide range of industrial grouping problems drawn from diverse fields such as logistics supply chain management project management manufacturing systems engineering design and healthcare are presented Typical complex industrial grouping problems with multiple decision criteria and constraints are clearly described using illustrative diagrams and formulations The problems are mapped into a common group structure that can conveniently be used as an input scheme to specific variants of grouping genetic algorithms Unique heuristic grouping techniques are developed to handle grouping problems efficiently and effectively Illustrative examples and computational results are presented in tables and graphs to demonstrate the efficiency and effectiveness of the algorithms Researchers decision analysts software developers and graduate students from various disciplines will find this in depth reader friendly exposition of advances and applications of grouping genetic algorithms an interesting informative and valuable resource Swarm, Evolutionary, and Memetic Computing Bijaya Ketan Panigrahi, Ponnuthurai Nagaratnam Suganthan, Swagatam Das, Suresh Chandra Satapathy, 2011-12-07 Annotation This volume constitutes the refereed proceedings of the Second International Conference on Swarm Evolutionary and Memetic Computing SEMCCO 2011 held in Visakhapatnam India in December 2011 The 124 revised full papers presented in both volumes were carefully reviewed and selected from 422 submissions Healthcare Staff Scheduling Michael Mutingi, Charles Mbohwa, 2015-09-08 Healthcare operations in hospitals and home healthcare settings are inundated with complex fuzzy features that impose difficulties in the creation of work schedules This book presents in depth research on emerging approaches to healthcare staff scheduling It starts by reviewing the key issues and challenges inherent in staff scheduling along with the basic concepts of fuzzy set theory Examining cutting edge research applications it details fuzzy optimization algorithms derived from biologically inspired approaches and fuzzy theory Facilitating a practical and in depth understanding of modern fuzzy metaheuristic optimization approaches the book presents recent research on multi criteria algorithms and their applications in healthcare operations particularly staff scheduling Manufacturing System Faieza

Abdul Aziz, 2012-05-16 This book attempts to bring together selected recent advances tools application and new ideas in manufacturing systems Manufacturing system comprise of equipment products people information control and support functions for the competitive development to satisfy market needs It provides a comprehensive collection of papers on the latest fundamental and applied industrial research. The book will be of great interest to those involved in manufacturing engineering systems and management and those involved in manufacturing research Manufacturing Science and Technology III Rajagopal Sivakumar, 2012-12-27 Selected peer reviewed papers from the 2012 3rd International Conference on Manufacturing Science and Technology ICMST 2012 August 18 19 2012 New Delhi India *Proceedings of the Sixth* International Conference on Genetic Algorithms Larry J. Eshelman, 1995 Genetic algorithms are a category of computer algorithms suggested by the evolutionary process of natural selection. The proceedings of the July 1995 conference include papers describing both the theory and practice of genetic algorithms and other forms of evolutionary computation including evoluti Evolutionary Algorithms Lawrence D. Davis, Kenneth De Jong, Michael D. Vose, L. Darrell Whitley, 2012-12-06 This IMA Volume in Mathematics and its Applications EVOLUTIONARY ALGORITHMS is based on the proceedings of a workshop that was an integral part of the 1996 97 IMA program on MATHEMATICS IN HIGH PERFORMANCE COMPUTING I thank Lawrence David Davis Tica Associates Kenneth De Jong Computer Science George Mason University Michael D Vose Computer Science The University of Tennessee and L Darrell Whitley Computer Science Colorado State University for their excellent work in organizing the workshop and for editing the proceedings Further appreciation is ex tended to Donald G Truhlar Chemistry and Supercomputing Institute University of Minnesota who was also one of the workshop organizers In addition I also take this opportunity to thank the National Science Foundation NSF Minnesota Supercomputing Institute MSI and the Army Research Office ARO whose financial support made the workshop possible Willard Miller Jr Professor and Director v PREFACE The IMA Workshop on Evolutionary Algorithms brought together many of the top researchers working in the area of Evolutionary Computation for a week of intensive interaction The field of Evolutionary Computation has developed significantly over the past 30 years and today consists a variety of subfields such as genetic algorithms evolution strate gies evolutionary programming and genetic programming each with their own algorithmic perspectives and goals

Proceedings of the Genetic and Evolutionary Computation Conference, 2001 The Practical Handbook of Genetic Algorithms Lance D. Chambers, 2019-09-17 The mathematics employed by genetic algorithms GAs are among the most exciting discoveries of the last few decades But what exactly is a genetic algorithm A genetic algorithm is a problem solving method that uses genetics as its model of problem solving It applies the rules of reproduction gene crossover and mutation to pseudo organism Evolutionary Algorithms in Management Applications Jörg Biethahn, Volker Nissen, 2012-12-06 Evolutionary Algorithms EA are powerful search and optimisation techniques inspired by the mechanisms of natural evolution They imitate on an abstract level biological principles such as a population based approach the inheritance of

information the variation of information via crossover mutation and the selection of individuals based on fitness The most well known class of EA are Genetic Algorithms GA which have received much attention not only in the scientific community lately Other variants of EA in particular Genetic Programming Evolution Strategies and Evolutionary Programming are less popular though very powerful too Traditionally most practical applications of EA have appeared in the technical sector Management problems for a long time have been a rather neglected field of EA research This is surprising since the great potential of evolutionary approaches for the business and economics domain was recognised in pioneering publications quite a while ago John Holland for instance in his seminal book Adaptation in Natural and Artificial Systems The University of Michigan Press 1975 identified economics as one of the prime targets for a theory of adaptation as formalised in his reproductive plans later called Genetic Algorithms Applied Stochastic Models and Data Analysis Ramón Gutiérrez, Mariano J. Valderrama, 1991 As with previous symposiums the main objective of the Sixth International Symposium is to publish papers of both technical and practical nature to present new findings uncovered by theoretical results which may have the potential to contribute solutions to real life problems With this objective in mind this collection of papers aims to serve as an interface between stochastic modeling and data analysis as well as their applications to the problems we face in the various fields The papers first focused on the theory application and interaction between stochastic models and data analysis The results and their applications to the problems we face in the fields of economics finance and insurance management marketing health sciences production and engineering are then explored GECCO-2001 Lee Spector, 2001

Proceedings of the ... International IEEE Conference on Tools for Artificial Intelligence ,2001 Proceedings of the ... IEEE Conference on Evolutionary Computation ,1998 Models and Algorithms for Planning and Scheduling Problems Philippe Baptiste, 2004 Practice and Theory of Automated Timetabling, 2000 Metaheuristics in **Combinatorial Optimization** Gilbert Laporte, Ibrahim H. Osman, 1996 1998 IEEE International Conference on Evolutionary Computation Proceedings IEEE Neural Networks Council, 1998 This collection of papers from the ICEC conference covers a wide range of aspects of evolutionary computing This includes principles of evolutionary computation such as adaptation and self adaption variation operators representational issues and theoretical investigations **Progress** in Connectionist-based Information Systems, 1998 These two volumes consist of about 350 papers in three main areas of artificial intelligence and neurocomputing namely 1 modelling the brain 2 methods of soft computing 3 applications of intelligent information systems The materials contained in two volumes emphasise the importance of connectionist based information systems which use neural networks and other methods to achieve intelligent information processing such as speech recognition and language understanding pattern recognition vision learning and adaptation planning and decision making Some of the methods of the connectionist based information systems directly model the physical organisation of the human brain which is the area of brain like computing Other methods model cognitive aspects of human behaviours which is

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