

Particle Swarm Optimization

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In this chapter, a brief introduction is given to Particle Swarm Optimization (PSO) and Ant Colony Optimization (ACO). Optimization is the process to find a best optimal solution for the problem under ...

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Usman Asad, and M. El-Hawary, "Solution of an Economic Dispatch Problem Through Particle Swarm Optimization: A Detailed Survey – Part II", IEEE Access, 2017. Ghulam Abbas, Jason Gu, Umar Farooq, M.

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Energy and Buildings. 2018. Volume 159. Pages 454-461. Karami, M. and L. Wang, Particle Swarm Optimization for Control Operation of an All-Variable Speed Water-Cooled Chiller Plant. Applied Thermal ...

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Fernández-Cabán, P.L., and Masters, F.J. (2018). "Hybridizing particle swarm and big bang-big crunch optimization methods to explore then exploit the design domain of large planar frame structures." ...

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Huidae Cho, Jeongha Park, Dongkyun Kim, March 2019. Evaluation of Four GLUE Likelihood Measures and Behavior of Large Parameter Samples in ISPSO-GLUE for TOPMODEL ...

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This is the first book devoted entirely to Particle Swarm Optimization (PSO), which is a non-specific algorithm, similar to evolutionary algorithms, such as taboo search and ant colonies. Since its original development in 1995, PSO has mainly been applied to continuous-discrete heterogeneous strongly non-linear numerical optimization and it is thus used almost everywhere in the world. Its convergence rate also makes it a preferred tool in dynamic optimization.

This book explains the theoretical structure of particle swarm optimization (PSO) and focuses on the application of PSO to portfolio optimization problems. The general goal of portfolio optimization is to find a solution that provides the highest expected return at each level of portfolio risk. According to H. Markowitz's portfolio selection theory, as new assets are added to an investment portfolio, the total risk of the portfolio's decreases depending on the correlations of asset returns, while the expected return on the portfolio represents the weighted average of the expected returns for each asset. The book explains PSO in detail and demonstrates how to implement Markowitz's portfolio optimization approach using PSO. In addition, it expands on the Markowitz model and seeks to improve the solution-finding process with the aid of various algorithms. In short, the book provides researchers, teachers, engineers, managers and practitioners with many tools they need to apply the PSO technique to portfolio optimization.

Although the particle swarm optimisation (PSO) algorithm requires relatively few parameters and is computationally simple and easy to implement, it is not a globally convergent algorithm. In Particle Swarm Optimisation: Classical and Quantum Perspectives, the authors introduce their concept of quantum-behaved particles inspired by quantum mechanics

Swarm Intelligence has emerged as one of the most studied artificial intelligence branches during the last decade, constituting the fastest growing stream in the bio-inspired computation community. A clear trend can be deduced analyzing some of the most renowned scientific databases available, showing that the interest aroused by this branch has increased at a notable pace in the last years. This book describes the prominent theories and recent developments of Swarm Intelligence methods, and their application in all fields covered by engineering. This book unleashes a great opportunity for researchers, lecturers, and practitioners interested in Swarm Intelligence, optimization problems, and artificial intelligence.

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This book is intended to gather recent studies on particle swarm optimization (PSO). In this book, readers can find the recent theoretical developments and applications on PSO algorithm. From the theoretical aspect, PSO has preserved its popularity because of the fast convergence rate, and a lot of hybrid algorithms have recently been developed in order to increase the performance of the algorithm. At the same time, PSO has also been used to solve different kinds of engineering optimization problems. In this book, a reader can find engineering applications of PSO, such as environmental economic dispatch and grid computing.

This book constitutes the refereed proceedings of the Second International Symposium on Intelligence Computation and Applications, ISICA 2007, held in Wuhan, China, in September 2007. The 71 revised full papers cover such topics as evolutionary computation, evolutionary learning, neural networks, swarms, pattern recognition, and data mining.

"This book presents the most recent and established developments of Particle swarm optimization (PSO) within a unified framework by noted researchers in the field"--Provided by publisher.

Swarm intelligence algorithms are a form of nature-based optimization algorithms. Their main inspiration is the cooperative behavior of animals within specific communities. This can be described as simple behaviors of individuals along with the mechanisms for sharing knowledge between them, resulting in the complex behavior of the entire community. Examples of such behavior can be found in ant colonies, bee swarms, schools of fish or bird flocks. Swarm intelligence algorithms are used to solve difficult optimization problems for which there are no exact solving methods or the use of such methods is impossible, e.g. due to unacceptable computational time. This set comprises two volumes: Swarm Intelligence Algorithms: A Tutorial and Swarm Intelligence Algorithms: Modifications and Applications. The first volume thoroughly presents the basics of 24 algorithms selected from the entire family of swarm intelligence algorithms. It contains a detailed explanation of how each algorithm works, along with relevant program codes in Matlab and the C++ programming language, as well as numerical examples illustrating step-by-step how individual algorithms work. The second volume describes selected modifications of these algorithms and presents their practical applications. This book presents 24 swarm algorithms together with their modifications and practical applications. Each chapter is devoted to one algorithm. It contains a short description along with a pseudo-code showing the various stages of its operation. In addition, each chapter contains a description of selected modifications of the algorithm and shows how it can be used to solve a selected practical problem.

Particle swarm optimization (PSO) is a population based stochastic optimization technique influenced by the social behavior of bird flocking or fish schooling. PSO shares many similarities with evolutionary computation techniques such as Genetic Algorithms (GA). The system is initialized with a population of random solutions and searches for optima by updating generations. However, unlike GA, PSO has no evolution operators such as crossover and mutation. In PSO, the potential solutions, called particles, fly through the problem space by following the current optimum particles. This book represents the contributions of the top researchers in this field and will serve as a valuable tool for professionals in this interdisciplinary field.