HANDBOOK OF WHALE OPTIMIZATION ALGORITHM

VARIANTS, HYBRIDS, IMPROVEMENTS, AND APPLICATIONS

EDITED BY
SEYEDALI MIRJALILI

Handbook of Whale Optimization Algorithm

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Variants, Hybrids, Improvements, and Applications

Edited by
Seyedali Mirjalili

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Preface

Welcome to "Whale Optimization Algorithm: Variants, Improvements, Hybrids, and Applications." In the ever-evolving world of Artificial Intelligence, optimization algorithms play a crucial role in solving complex problems across various domains. Among the plethora of meta-heuristic techniques, the Whale Optimization Algorithm (WOA) has emerged as one of the most well-regarded and widely-used approaches.

The WOA has garnered significant attention due to its effectiveness in addressing optimization problems, both in scientific research and industrial applications. However, harnessing the full potential of this algorithm requires tackling numerous challenges. These challenges range from dealing with multiple objectives and constraints to handling binary decision variables, large-scale search spaces, dynamic objective functions, and noisy parameters, to name just a few.

This handbook aims to provide you with an in-depth analysis of the Whale Optimization Algorithm and the existing methods in the literature that address these challenges. We delve into the fundamental concepts and principles behind the WOA, exploring its strengths and limitations. By reviewing the extensive body of literature surrounding this algorithm, we offer insights into its applications across various domains.

But this book goes beyond a comprehensive analysis of the WOA. It also presents a collection of improvements, variants, and hybrids that have been developed to enhance its performance and overcome specific challenges. These novel approaches push the boundaries of the algorithm, offering new possibilities for optimization in different contexts. By incorporating these advancements, you will be equipped with a broader toolkit to tackle complex optimization problems.

Furthermore, this handbook showcases a range of real-world applications that demonstrate the practical applicability of the methods presented within. From engineering to finance, from healthcare to logistics, the WOA finds its place in diverse domains, addressing critical challenges and delivering valuable solutions.

I would like to express my gratitude to the researchers, practitioners, and enthusiasts who have contributed to the development and understanding of the Whale Optimization Algorithm. Without their dedication and expertise, this book would not have been possible.

I hope that this handbook serves as a valuable resource for both researchers and practitioners in the field of optimization. Whether you are a seasoned expert or a newcomer to the domain, we believe that the insights and methodologies presented here will inspire new ideas, facilitate problem-solving, and foster innovation.

Enjoy your journey into the world of the Whale Optimization Algorithm, where the search for optimal solutions meets the vastness of possibility.

Seyedali Mirjalili
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