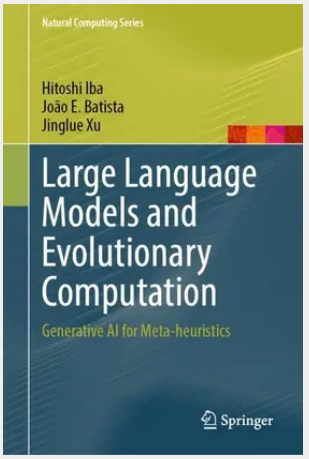
Iba / Batista / Xu

Large Language Models and Evolutionary Computation

Generative AI for Meta-heuristics



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This book provides theoretical and practical knowledge of an LLM (Large Language Model)-based approach to metaheuristics. In this book, the basic theory and the latest techniques are explained in an easy-to-understand manner, with concrete examples. Another emphasis is its real-world applicability. The book presents empirical examples from practical data and show that the proposed approaches are successful when addressing tasks from the recent research areas such as (1) LLMs for EC (Evolutionary computation), (2) training LLMs for EC, (3) automated machine learning, and (4) program synthesis, etc., details of which will be provided in the appendix for the sake of readers' study. These materials will include a description of available resources for readers interested in gaining hands-on experience with the subject. The fundamental themes of this book, therefore, include recent research on the promising combination of Generative AI, LLMs, evolutionary computation, and metaheuristics. The ultimate goal of this book is to enable readers to apply these ideas to artificial intelligence on their own.
This book is intended for beginners interested in artificial intelligence and artificial life (from undergraduate to graduate students), researchers in related fields, and engineers considering their applications. Therefore, most topics in this book begin with accessible subjects that require no specialized knowledge, though some connect to unsolved problems and cutting-edge research themes.

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