Algorithmics for Hard Problems: Introduction to Combinatorial Optimization, Randomization, Approximation, and Heuristics (Texts in Theoretical Computer Science. An EATCS Series)

By Juraj Hromkovi?

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Algorithmic design, especially for hard problems, is more essential for success in solving them than any standard improvement of current computer tech nologies. Because of this, the design of algorithms for solving hard problems is the core of current algorithmic research from the theoretical point of view as well as from the practical point of view. There are many general text books on algorithmics, and several specialized books devoted to particular approaches such as local search, randomization, approximation algorithms, or heuristics. But there is no textbook that focuses on the design of algorithms for hard computing tasks, and that systematically explains, combines, and compares the main possibilities for attacking hard algorithmic problems. As this topic is fundamental for computer science, this book tries to close this gap. Another motivation, and probably the main reason for writing this book, is connected to education. The considered area has developed very dynami cally in recent years and the research on this topic discovered several profound results, new concepts, and new methods. Some of the achieved contributions are so fundamental that one can speak about paradigms which should be in cluded in the education of every computer science student. Unfortunately, this is very far from reality. This is because these paradigms are not sufficiently known in the computer science community, and so they are insufficiently com municated to students and practitioners.

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Editorial Review

From the Back Cover
There are several approaches to attack hard problems. All have their merits, but also their limitations, and need a large body of theory as their basis. A number of books for each one exist: books on complexity theory, others on approximation algorithms, heuristic approaches, parametrized complexity, and yet others on randomized algorithms. This book discusses thoroughly all of the above approaches. And, amazingly, at the same time, does this in a style that makes the book accessible not only to theoreticians, but also to the non-specialist, to the student or teacher, and to the programmer. Do you think that mathematical rigor and accessibility contradict? Look at this book to find out that they do not, due to the admirable talent of the author to present his material in a clear and concise way, with the idea behind the approach spelled out explicitly, often with a revealing example.
Reading this book is a beautiful experience and I can highly recommend it to anyone interested in learning how to solve hard problems. It is not just a condensed union of material from other books. Because it discusses the different approaches in depth, it has the chance to compare them in detail, and, most importantly, to highlight under what circumstances which approach might be worth exploring. No book on a single type of solution can do that, but this book does it in an absolutely fascinating way that can serve as a pattern for theory textbooks with a high level of generality. (Peter Widmayer)
The second edition extends the part on the method of relaxation to linear programming with an emphasis on rounding, LP-duality, and primal-dual schema, and provides a self-contained and transparent presentation of the design of randomized algorithms for primality testing.

Users Review

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Julie Kappel:

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Jamie Gregory:

Your reading 6th sense will not betray anyone, why because this Algorithmics for Hard Problems: Introduction to Combinatorial Optimization, Randomization, Approximation, and Heuristics (Texts in Theoretical Computer Science. An EATCS Series) guide written by well-known writer who knows well how to make book that can be understand by anyone who else read the book. Written throughout good manner for you, still dripping wet every ideas and publishing skill only for eliminate your hunger then you still doubt Algorithmics for Hard Problems: Introduction to Combinatorial Optimization, Randomization, Approximation, and Heuristics (Texts in Theoretical Computer Science. An EATCS Series) as good book not just by the cover but also by the content. This is one guide that can break don't determine book by its include, so do you still needing yet another sixth sense to pick this specific!? Oh come on your reading sixth sense already said so why you have to listening to another sixth sense.

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