Preface

Algorithms are omnipresent in our modern world. They show us the optimal routes, prevent and assess risks, provide forecasts, anticipate or assist our decisions. They have become an essential part of our daily lives. These algorithms are mostly based on optimization processes and consist in minimizing or maximizing a criterion under certain constraints, thus indicating feasible and intelligent solutions, allowing us to plan a process to be carried out in the best possible way.

There are many different optimization methods, based on various heuristics, sometimes simple and intuitive, sometimes more elaborate and requiring fine mathematical developments.

It is through this jungle of algorithms, resulting from decades of research and development, that Max Cerf guides us with all his expertise, his intuition and his pragmatism.

Max Cerf has been a Senior engineer at ArianeGroup for 30 years. As a recognized specialist in trajectography, he designs and optimizes spacecraft trajectories under multiple constraints. He has thus acquired and developed a comprehensive knowledge of the best algorithms in continuous optimization, discrete optimization (on graphs) and optimal control. He is also an exceptional teacher, with a real talent for explaining complicated concepts in a clear and intuitive way.

With this double book, he offers an invaluable guide to the non-specialist reader who wishes to understand or solve optimization problems in the most efficient way possible.

Emmanuel Trélat, Sorbonne University, Paris