Part 2

Trajectory-based algorithms

Now that part 1 has armed you with a solid foundation in optimization, we'll continue our journey into the realm of optimization algorithms, focusing on trajectory-based algorithms. This part of the book, consisting of two chapters, will take your optimization knowledge to the next level.

In chapter 5, you'll learn about trajectory-based optimization algorithms and, specifically, the simulated annealing algorithm—you'll discover how simulated annealing can be applied to solve continuous and discrete optimization problems. You'll explore function optimization as an example of continuous optimization, tackle puzzle games like Sudoku as instances of constraint satisfaction problems, delve into permutation problems such as the traveling salesman problem, and even apply simulated annealing to real-world problems, like optimizing delivery routes for semi-trucks.

Chapter 6 will introduce you to tabu search as another trajectory-based optimization algorithm. You'll learn the fundamentals of local search and how tabu search builds upon this foundation. This chapter will take you through solving constraint satisfaction problems, continuous optimization problems, routing problems, and balancing assembly lines in manufacturing.

By the end of this part, you'll have a deep understanding of trajectory-based optimization algorithms and the diverse problem domains they can effectively address. These chapters will equip you with valuable tools to tackle complex optimization problems across a wide range of applications.