

Ant Colony Optimization

Luca M. Gambardella
IDSIA
Manno - Switzerland

Abstract

Recently, many researchers have focused their attention on a new class of algorithms called metaheuristics. Metaheuristics are rather general algorithmic frameworks which can be applied to several different optimization problems. Metaheuristics are often inspired by natural processes and one of the most recent nature-inspired metaheuristic is ant colony optimization. There, the inspiring natural process is the foraging behavior of ants. In fact the ant colony optimization is a population-based approach in which a set of agents (artificial ants) cooperate to build solutions using an indirect form of communication mediated by deposited pheromone. We will present the basic principles of ant colony optimization and some applications to Vehicle Routing and Scheduling Problems.