Abstract

This paper describes the organizational modeling of the Ant Colony Optimization (ACO). It presents a modeling approach of the ACO based on Holonic Multi-Agent paradigm named HMAS (Holonic Multi-Agent Systems). The approach of modeling used is organizational and it uses four basic concepts: Capacity, Role, Interaction, and Organization (CRIO). The Traditional modeling techniques fail to capture interactions between loosely coupled aspects of a complex system. However, the organizational model of the ACO has highlighted the different roles that can occur in such optimization device. The solving approach highlights two fundamental concepts from behavioral intensification and diversification. Since, it is difficult to distinguish an intensification from a diversification behavior, though these two trends are identifiable in the organizational model of the proposed ACO, a single role can combine the roles Intensify and Diversify. So, a Manager role is identified and is responsible for the coordination of research by the colonies, and the management of the pheromone memory.

References

- C. Blum and A. Roli. Metaheuristics in combinatorial optimization: Overview and
ACO Modeling: Organizational Modeling of an Ant Multi-Colonies Optimization Approach


Index Terms

Computer Science
Information Science

Keywords

Ant agent colony metaheuristic multi-agent organization role sensor