

Abstract

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Structure assembly by communicating robot swarms

Swarm Intelligence (SI) is the property of a system whereby the collective behaviours of (unsophisticated) agents interacting locally with their environment cause coherent functional global patterns to emerge. SI provides a basis with which it is possible to explore collective (or distributed) problem solving without centralized control the provision of a global model. The agents follow very simple rules, and no centralized control using the partially completed structure to coordinate their actions. This mechanism is analogous to that of stigmergy used by social insects, in which insects take actions that affect the environment, and the environmental statue influences further actions. We present an algorithm for assembly of any shape. The algorithm is inspired by the nest building behaviour of ants.