

Emergent exploration and resource gathering in collaborative robotic environments

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ABSTRACT

The last years demonstrated a significant increase in the interest for emergent, collaborative robotics as a viable alternative to the more centralized classic approach. The design and implementation of a system of numerous cheaper robots have become more attractive than the construction of a larger, more expensive robot. This paper describes the algorithm which is used by a collaborative system of autonomous robots to find food sources (resources) on an unknown territory. As a case study, the implementations of this algorithm using a robotic collective composed of LEGO Mindstorm robots is discussed in this article. Some of the more interesting experimental results are also presented.

INDEX TERMS

- **INSPEC**

- **Controlled Indexing**

- collision avoidance , intelligent robots , mobile robots , multi-robot systems

- **Non Controlled Indexing**

- LEGO Mindstorm robot , autonomous robot , cheaper robot , collaborative robotic environment , emergent exploration behavior , obstacle avoidance , resource gathering

- **Author Keywords**

- Emergent behavior , collective robotics , exploration , resource gathering