Context-Aware Emergent Behaviour in a MAS for Information Exchange

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Abstract—The plethora of interconnected devices that surrounds modern people has yet to work together as whole. An intelligent environment must sense and react to the actions of people, but to that end a large quantity of information must be exchanged throughout the system. Under realistic conditions, it is impossible to control and coordinate the exchange of information in a centralized way. Solving this problem involves key concepts like self-organization, emergent behavior and context-awareness. Continuing previous work on self-organizing cognitive multi-agent systems for the exchange and management of information, this paper introduces two aspects of context-awareness – pressure and interest – that make the system's emergent behavior more context-sensitive and, therefore, more adaptive to a changing environment.

Service Negotiation Framework for Disaster Management

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Abstract - Interactions between stakeholders providing their services in disaster management might involve negotiations for optimal selection of service providers. In this paper we propose a framework for such negotiations and we drive an example of how this framework can be used in a disaster management system.

Algorithmic Solutions for Several Offline Constrained Resource Processing and Data Transfer Multicriteria Optimization Problems

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Abstract—In this paper we present novel algorithmic solutions for several offline problems which are inspired by situations encountered in the resource processing and data transfer multicriteria optimization domains. The results of most of the presented techniques are strategies which solve the considered problems (almost) optimally. Thus, the developed algorithms construct intelligent strategies which can be implemented by agents in specific situations. All the described solutions make use of the properties of the considered problems and, thus, they are not applicable to a very general class of problems. However, by considering the specific details of each problem, we were able to obtain very efficient results.

Multi-Agent Oriented Architecture for Data-Stream Processing in an Ambient Assisted Living System

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Abstract - The goal of this article is to propose a flexible and scalable architecture for an intelligent sensor data processing middleware oriented for ambient assisted living systems. The proposed solution is based on multi-agent model in order to response at ambient intelligent systems challenges.

Solving the Traveling Salesman Problem Using Ant Colony Optimization on a Distributed Architecture

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Abstract - We propose a distributed multi-agent implementation of the Ant Colony Optimization algorithm. We designed the architecture as a network of intelligent software agents representing the nodes of the graph. Ant management is reduced to message exchanges between graph nodes. We introduce an innovative natural way of implementing the evaporation of pheromone as a parallel ticker behavior in each agent of the network. This paper provides an experimental analysis of the algorithm when used to solve the well-known Traveling Salesman Problem.

Engineering Biologically-Inspired Multi-Agent Feedback Loops for Autonomic Computing

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Extended Abstract