World Academy of Science, Engineering and Technology
International Journal of Computer and Systems Engineering
Vol:17, No:07, 2023

A Bio-Inspired Approach for Self-Managing Wireless Sensor and Actor Networks

Authors : Lyamine Guezouli, Kamel Barka, Zineb Seghir

Abstract : Wireless sensor and actor networks (WSANs) present a research challenge for different practice areas. Researchers are trying to optimize the use of such networks through their research work. This optimization is done on certain criteria, such as improving energy efficiency, exploiting node heterogeneity, self-adaptability and self-configuration. In this article, we present our proposal for BIFSA (Biologically-Inspired Framework for Wireless Sensor and Actor networks). Indeed, BIFSA is a middleware that addresses the key issues of wireless sensor and actor networks. BIFSA consists of two types of agents: sensor agents (SA) that operate at the sensor level to collect and transport data to actors and actor agents (AA) that operate at the actor level to transport data to base stations. Once the sensor agent arrives at the actor, it becomes an actor agent, which can exploit the resources of the actors and vice versa. BIFSA allows agents to evolve their genetic structures and adapt to the current network conditions. The simulation results show that BIFSA allows the agents to make better use of all the resources available in each type of node, which improves the performance of the network.

Keywords : wireless sensor and actor networks, self-management, genetic algorithm, agent.
Conference Title : ICCPSMLA 2023 : International Conference on Computer Science, Machine Learning and Algorithms
Conference Location : Paris, France
Conference Dates : July 10-11, 2023

Open Science Index, Computer and Systems Engineering Vol:17, No:07, 2023 publications.waset.org/abstracts/162585.pdf