Abstracts

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Priority-Based Task Cooperation for Multi Robot Systems

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Abstract: In this research, a novel self-organizing map (SOM)-based multi-agent architecture is proposed for task assignment coordination and cooperation of a multi-robot system. A set of static or moving targets are randomly distributed in a finite environment (workspace). Every target requires a specific number of robots (that is generally unknown to the robots) to complete a task at its location. Hence, the goal is to dynamically assign a adequate team of robots to every target location or one robot to several target locations with minimal travel distance for each robot. The task is completed when every target has the desired number of robots. The proposed approach integrates the task requirement of robots and the robot motion planning such that the robots can change their direction of movement according to changes in the environment. Unlike most conventional models that are suitable to static environments only, the proposed approach is capable of dealing with non-stationary environments.

Keywords: Multi-agent, Multi-robot system, task assignment, cooperation.

Fuzzy Building Blocks for Artificial Neural Networks

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Abstract: In this study a new building block for artificial neural network is introduced. The new architecture adds some sorts of flexibility to the ANN neurons. Unlike other types of flexible neurons for neural network, the shaping parameters in this structure appear linearly in the output of the neural network. This makes training procedure much easier and more precise. The resulting neural network has been tested on a number of test function and satisfactory results have been achieved.

Keywords: Neural network, structure of neural networks, Tansig, fuzzy.