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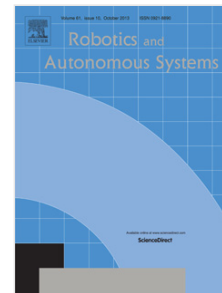
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Navigation of Multiple Mobile Robots in a highly clutter terrains using Adaptive Neuro-Fuzzy Inference system

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Abstract

In recent years, the interest in research on robots has increased extensively; mainly due to avoid human to involve in hazardous task, automation of Industries, Defence, Medical and other household applications. Different kinds of robots and different techniques are used for different applications. In the current research proposes the Adaptive Neuro Fuzzy Inference System (ANFIS) Controller for navigation of single as well as multiple mobile robots in highly cluttered environment. In this research it has tried to design a control system which will be able decide its own path in all environmental conditions to reach the target efficiently. Some other requirement for the mobile robot is to perform behaviours like obstacle avoidance, target seeking, speed controlling, knowing the map of the unknown environments, sensing different objects and sensor-based navigation in robot's environment.

Keywords: *Adaptive Neuro-Fuzzy Inference system; Fuzzy Logic; Neural Network; Navigation; Mobile Robot; ANFIS;*

1. Introduction

ANFIS is the combination of both Fuzzy Logic and Neural Network. An important property of a fuzzy system is that knowledge is represented in the form of the easily comprehensible logical rules. On the other hand, neural networks have the ability to use knowledge & experience. By combining both fuzzy and neural paradigms, neuro-fuzzy controllers can be developed. Fuzzy logic approach to incorporate the logical inputs of human and take decision much faster. Neural controllers learn the discrete input representations, which may cause such system unstable. Hui et al. [1] have developed a hybrid technique for navigation system of mobile robot. They used the neuro-fuzzy controller to find the path planning strategy with obstacle avoidance behaviour in a dynamic environment. Cavalcanti et al. [2] have applied different techniques as neural networks, genetic algorithms, and Nano robotics concepts to solve the problem of automation of mobile robots for the application in medicine. Mbede et al. [3] have used intelligent motion control strategy that makes possible the integration of fuzzy obstacle avoidance, multisensory based motions, and robust recurrent neural network

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