

# Smart prolong fuzzy wireless sensor-actor network for agricultural application

## Abstract

The advances in pervasive communication, sensing and computing of wireless sensor networks technologies are leading to the emergence of wireless sensor-actor networks. The spreading merit of WSN has led to increasing interest in rendering them with expert knowledge to be smart and autonomous networks, which have the potential to enable a large class of applications in multiple fields. Fusion of artificial intelligent with wireless sensor actor networks (WSAN) is emerging as a new generation of smart autonomous WSN. Primarily two most important greenhouse climate parameters are considered which are the temperature and humidity during diurnal and nocturnal time. Actuator and sensor nodes has been managed by cognitive wireless sensor-actor network based greenhouse (CWSAN-GH) Coordinator node (MGHSN) which mimics the brain of the laborer to provide reliable, power conserving, autonomous control system of a greenhouse climate. Fuzzy logic controller enables engineers to control more complex systems more effectively than the conventional control methods which are not efficient in terms of energy, labor interference, productivity and flexibility. This paper presents the fusion of artificial intelligence represented by FIS with WSN for greenhouse climate control. Also the long life operation of network nodes based on the low power consumption is presented. Smart algorithm of the network sensor nodes, which contributes of reducing the power consumption, is addressed in detail. Initial field test for the CWSAN-GH is presented too. The combination of AI with actor WSN proves high efficiently, cost effective method, beside flexibility of tuning the whole system for other agricultural tasks.