

## Design an Intelligent Fire Detection System Based on Neural Network and Particle Swarm Optimization

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**Abstract :** In-time detection of fire in buildings is of great importance. Employing intelligent methods in data processing in fire detection systems leads to a significant reduction of fire damage at lowest cost. In this paper, the raw data obtained from the fire detection sensor networks in buildings is processed by using intelligent methods based on neural networks and the likelihood of fire happening is predicted. In order to enhance the quality of system, the noise in the sensor data is reduced by analyzing wavelets and applying SVD technique. Meanwhile, the proposed neural network is trained using particle swarm optimization (PSO). In the simulation work, the data is collected from sensor network inside the room and applied to the proposed network. Then the outputs are compared with conventional MLP network. The simulation results represent the superiority of the proposed method over the conventional one.

**Keywords :** intelligent fire detection, neural network, particle swarm optimization, fire sensor network

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