ABSTRACT

The use of wireless transmission is part of everyone's life. Every day more people are exchanging their wired devices to wireless technology. This is due to their advantages, such as ease of installation and maintenance, reducing installation time devices, cost savings projects, economic infrastructure, device configuration flexibility, savings in assembly cost, flexibility in altering existing architectures and others. Now the area of industrial automation is also increasing interest in this technology wireless. In this area the safety, reliability and robustness of data is of great importance. So in order to minimize the effects of interferences scattering techniques in frequency and mesh topology are used for transmission of data from the sensors to the router nodes to reach the gateway. Thus, the positioning of the nodes in the mesh network routers ensures that the network will present a good performance. This work proposes a tool for positioning intermediate routers in mesh networks, called POSIMNET (Immune Network Positioning), which assists the designer to find the best configuration of the industrial automation wireless network. The POSIMNET is based on artificial immune networks, which proposes to create n paths between the sensor nodes and the gateway by removing, cloning and reconfiguration of intermediate routers. Furthermore, the algorithm is also able to meet the criteria for low-grade failure and low number of retransmission by routers. These criteria can be enabled individually or combined with equal or different weights at user's discretion. The POSIMNET tool consists of two modules: (i) Immune Network – which combines elements of two models of immune networks (SSAIS and AINET), (ii) Potential Fields - positions router nodes unsing potential fields, where critic sensors attracts then while obstacles and other network elements repel them.

Keywords: Placement of router nodes; Industrial Automation, immune Network; Potential fields.