

Project Title: Investigation of the Possibility of Implementing PSO in Radio Signal Prediction and Optimization
Project No.: RG046-10ICT
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Abstract:

The purpose of this study is to introduce a novel model that efficiently predicts the trajectory of the radio signal and at the same time can provide optimum wireless coverage. This study explores an efficient and faster ray-tracing technique based on binary angle division for radio signal prediction in indoor environment as well as optimization technique for indoor wireless coverage. It minimizes the number of transmitters in the corresponding indoor area using a novel integrated approach of the proposed ray-tracing and genetic algorithm (GA). The simulation results generated from the proposed ray-tracing technique are compared with the conventional ray-tracing and the ray launching techniques to prove the superiority of the proposed algorithm in terms of both computational efficiency and accuracy. It is found that the proposed ray tracing system achieves better performance in terms of higher computational efficiency of about 22.17% and superior average accuracy of 94% in case of signal prediction compared to other existing technique. On the other hand, the proposed coverage algorithm outperforms the existing algorithm in terms of both space and time complexities. The proposed coverage algorithm also proves that the computation time is much less than that of the existing algorithm. The outcome of this study will facilitate the wireless radio networks and personal communication services inside buildings.