Abstract

The importance of services, based on current location of objects is growing. This is because Global Navigation Satellite System (GNSS) cannot provide object position inside buildings. In modern era the Location Based Services (LBS) are tremendously dependent on Indoor Positioning System (IPS). Parallel RPROP and greedy algorithm were combined for development of IPS using Received Signal Strength (RSS) in heterogeneous environment, the environment comprised of human activity, walls material, cupboards, and various type of surveying machines etc. The propagation of Wi-Fi signal varies directionally, therefore to cope with direction changes in signals; this proposed model produces three sets of weights, which could be considered best for easting, northing and height respectively. Proposed model was trained with 75% of collected data and tested on remaining 25% data. Distance error between
known points and predicted coordinates was used for accuracy assessment. Through experiments a maximum accuracy of 0.87m was achieved and it was found that median error was less than mean error. Median error between known points and predicted coordinates was about 3.32m and their mean error was about 4.62m, which is satisfactory as far as 3D position determination is concerned. On the basis of results the use of parallel RPROP and greedy algorithm for 3D position determination in heterogeneous environment is recommended.

References

3-Dimensional Indoor Positioning System based on WI-FI Received Signal Strength using Greedy Algorithm and Parallel Resilient Propagation


Index Terms

Computer Science
Algorithms

Keywords

WI-FI  Parallel Resilient Propagation  Position Tracking System