Abstract

Localization is considered to be one of the most significant research issues in a Wireless Sensor Networks (WSN). The major objective of localization is in estimating the physical co-ordinates of a group of sensor nodes distributed along its sensing field. The location information plays a prominent role for coverage and deployment of sensor nodes, routing and target tracking applications as well. The objective of this work is to determine the location of the sensor nodes with minimal error and high precision. Initially, the location estimation for the sensor nodes is carried out by using Mobile Anchor Positioning with Mobile Anchor & Neighbor (MAP-M&N), a range-free localization method. As the anchors move through the network, they broadcast their location as beacon packets. The sensor nodes use the location information of beacon packets obtained from mobile anchors and also the location packets from neighboring nodes to calculate their location. In order to get better location accuracy, Ant Colony Optimization with Mobile Anchor Positioning (ACO-MAP) is proposed for localization in WSN. The goal of this work is to compare the performance of ACO-MAP and MAP-M&N approaches by taking into consideration Root Mean Square Error (RMSE) as the performance metric.
Simulation results reveal the fact that, Ant Colony Optimization with Mobile Anchor Positioning (ACO-MAP) is efficient to minimize the localization error when compared to MAP-M&N algorithm.

References


Error Minimization in Localization of Wireless Sensor Networks using Ant Colony Optimization


Index Terms

Computer Science  Wireless
Keywords

Localization, Mobile Anchor, Wireless Sensor Network, Ant Colony Optimization, Root Mean Square Error;