Abstract

In Wireless sensor networks (WSNs) large number of sensors deployed in the Region of interest (ROI). Most of the applications in WSNs require location information because data sensed by sensors without location information is meaningless. Determining the physical location of the sensors after they have been deployed is known as problem of localization. Existing technique based on single mobile anchor node equipped with a geographical positioning system (GPS) broadcasts its co-ordinates to help other unknown nodes to localize themselves. In the 2D space, if a node knows its distance from three reference points, its position can also be determined. One more reference point is needed in the 3D space to determine the current position of the target device. This project develops a trajectory of mobile anchor node to reduce the localization error and minimize the distance covered by the mobile anchor node. The model considered in this work is sensors are deployed in a rectangular region and a mobile anchor node to follow a predefined static path and periodically broadcast its updated location co-ordinates to nearby nodes. The unknown nodes calculate their location co-ordinate based on trilateration.The proposed path planning guarantees that all the sensor nodes obtain their locations. The performance of this scheme is evaluated by conducting a series simulations using ns-2 network simulator. The result shows that the proposed path planning significantly outperforms the random movement of anchor node in terms localization error, distance travelled by the sensor and the percentage of localized sensor nodes.

Keywords: Wireless sensor networks, Localization, Anchor node, Path planning, Trilateration.