

Chapter 6

Conclusions

With the presence of faulty readings, the accuracy of aggregate results is greatly affected. In this paper, we considered the important problem of filtering out the faulty readings in sensor networks so as to improve the data accuracy. The challenge problem is to distinguish between faulty readings and unusual readings caused by environments. In order to deal with this problem, we first formulated the similarity of sensor behaviors (referred to as trust relation) among sensors in term of both spatial and temporal behaviors of sensors. Given a trust relations among sensors, a correlation network, which is an overlay network, is built to model the relationships among sensors. Based on the correlation network, we calculate SensorRank to model the reputation of each sensor. The reputation of a sensor indicates the resources to be correctly identified as faulty or not. By exploiting trust relations, each sensor can clearly know which nearby sensors are more similar. On the other hand, through the values of SensorRank of nearby sensors, a sensor will clearly know which sensors have more confidence for voting. Based on the SensorRank and trust relations, TrustVoting algorithm was proposed to judiciously identify and filter out faulty readings to improve the accuracy of aggregate results. Performance studies were comparatively analyzed. It was shown by our simulation results that by exploiting SensorRank, algorithm TrustVoting is able to effectively detect and filter out faulty readings, showing the effectiveness of our proposed algorithm.