Abstract

Wireless Sensors enable fine grain monitoring of activities of individual and social interest. Typically these sensors sense & send data continuously directly or through other sensor nodes to a base station. Wireless Sensor Data are inherently noisy and have frequent random spikes due to dynamic nature of the medium. Hence, the decision at the receiving node based on such data is likely to be erroneous. Erroneous data and decisions may affect its transformation to meaningful form like "context". It is therefore desirable to clean the data for improved context extraction. Bayesian Belief Networks are used here to quantitatively encode the dependencies among various sensors. These dependencies are then used to estimate missing data and also to detect and recover from errors. Cleaned data is then used for deriving Contextual Information and it results in improved context feature calculation. In this paper five algorithms for Bayesian Belief Network Construction have been evaluated and their performance of classification studied. Conjunctive rules are defined to map the sensors to already defined context. A secondary data obtained from weather sensor boards installed at Intel research lab at Berkeley have been used to demonstrate the approach.
References

- M. Raymer, T. Doom, L. Kuhn, and W. Punch, "Knowledge discovery in medical and biological datasets using a hybrid bayes classifier/evolutionary algorithm
Online Cleaning of Wireless Sensor Data Resulting in Improved Context Extraction

Index Terms

Computer Science

Wireless

Keywords

Wireless Sensor Networks
Bayesian Belief Networks
Sensor Data Recovery & Classification
Context Extraction