Accepted Manuscript

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PII: S0167-739X(18)30728-3
DOI: https://doi.org/10.1016/j.future.2018.09.034
Reference: FUTURE 4469

To appear in: *Future Generation Computer Systems*

Received date : 29 March 2018
Revised date : 13 July 2018
Accepted date : 12 September 2018

Please cite this article as: C.M. de Farias, et al., A multi-sensor data fusion technique using data correlations among multiple applications, *Future Generation Computer Systems* (2018), https://doi.org/10.1016/j.future.2018.09.034

A Multi-Sensor Data Fusion Technique Using Data Correlations among Multiple Applications

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Abstract

While wireless sensor networks (WSNs) have been traditionally tasked with single applications, in recent years we have witnessed the emergence of WSNs that allow the sensing and communication infrastructure to be shared among multiple applications thus optimizing the use of resources. As the number of applications in a WSN increases, a growing amount of sensor-generated data will be produced, from which useful information can be extracted. A major requirement in these networks is to save energy in order to extend their operational lifetime. However, wireless sensors and actuators commonly rely on batteries as their energy resources, whose replacement is undesirable or unfeasible. Among the methods employed to extend network lifetime, Multisensor data fusion (MDF) is one of the most widely used. Traditional MDFs are not able to identify different contexts, since they are designed using an application-specific design for the network. As the number of applications increases, the application data spaces overlap and it becomes more complex to identify the origin of each data sample to deliver data to the correct application, with the consequence of reducing data accuracy. In order to overcome these limitations, we propose a MDF technique that divides the monitored interval into a set of intervals (non-

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