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Claudio M. de Farias, Luci Pirmez, Giancarlo Fortino,
Antonio Guerrieri



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

Claudio M. de Farias^a, Luci Pirmez^a, Giancarlo Fortino^{b,c}, Antonio Guerrieri^c

^aUniversidade Federal do Rio de Janeiro - Av. Athos da Silveira Ramos, Prédio do CCMN, NCE, Ilha do Fundo, Rio de Janeiro, Brazil

^bDepartment of Electronics, Informatics and Systems, University of Calabria, Via P. Bucci 41C, 87036 Rende (CS), Italy

^cCNR - National Research Council of Italy - Institute for High Performance Computing and Networking (ICAR), Via P. Bucci 7-11C, 87036 Rende (CS), Italy

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 sources, 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 ranges 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-

Email addresses: cmicelifarias@gmail.com (Claudio M. de Farias),
luci.pirmez@gmail.com (Luci Pirmez), giancarlo.fortino@unical.it (Giancarlo Fortino),
guerrieri@icar.cnr.it (Antonio Guerrieri)

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