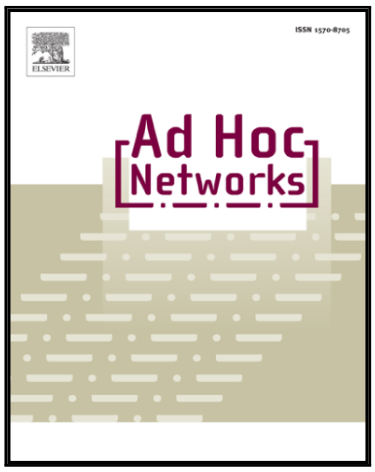

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PII: S1570-8705(18)30243-9
DOI: 10.1016/j.adhoc.2018.05.010
Reference: ADHOC 1678

To appear in: *Ad Hoc Networks*

Received date: 11 April 2018
Accepted date: 21 May 2018

Please cite this article as: Alessandro Enrico Redondi, Matteo Cesana, Luigi Fratta, Antonio Capone, Flaminio Borgonovo, A Prediction-Based Approach for Features Aggregation in Visual Sensor Networks, *Ad Hoc Networks* (2018), doi: 10.1016/j.adhoc.2018.05.010

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Abstract

Visual Sensor Networks (VSNs) constitute a key technology for the implementation of several visual analysis tasks. Recent studies have demonstrated that such tasks can be efficiently performed following an operative paradigm where cameras transmit to a central controller local image features, rather than pixel-domain images. Furthermore, features from multiple camera views may be efficiently aggregated exploiting the spatial redundancy between overlapping views. In this paper we propose a routing protocol designed for supporting aggregation of image features in a VSN. First, we identify a predictor able to estimate the efficiency of local features aggregation between different cameras in a VSN. The proposed predictor is chosen so as to minimize the prediction error while keeping the network overhead cost low. Then, we harmonically integrate the proposed predictor in the Routing Protocol for Low-Power and Lossy Networks (RPL) in order to support the task of in-network feature aggregation. We propose a RPL objective function that takes into account the predicted aggregation efficiency and build the routes from the camera nodes to a central controller so that either energy consumption or used network bandwidth is minimized. Extensive experimental results confirm that the proposed approach can be used to increase the efficiency of VSNs.

Keywords: Visual Sensor Networks, Multi-View Features Compression, RPL