Self-controlled sensor network

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Abstract. This paper briefly describe my field of interest and future work.

Keywords: data analyzing, sensor motes, sensor network, sensor gateway.

1 Introduction

Today control systems are part of fast in every place like intelligent house, industry, traffic or cities. With increasing amount of control systems is increasing amount of sensors, which has higher demands on higher quality of information. This leads me to create sensor network, which will provide information with best quality to controller system and creating a unified interface to sensor network (to be open to every system).

This implementation will be suitable for application in buildings, office, industry or cities for monitoring, analyzing and control. To reach the best information quality I am working on an intelligent methods. Thanks them the sensor network will be able to behave without human intervention and satisfy the best information value even when occurs problem in sensor network.

Design of whole architecture has not been finished yet and I am trying to find best ways to reach the best quality of information from monitored environment.

2 Sensor network specification

Today, my sensor network consists of two types of devices. The types are sensor motes and sensor gateways.

To get the best information about monitored environment is needed a suitable amount of sensors. With enlarging amount of sensors is difficult to find way how to manage them and satisfy the best quality of monitored environment. My goal is to find and implement methods to analyze data from sensors and evaluate actions/corrections for sensors networks. The actions for sensor networks should lead to get better quality of information. For example, when one sensor will fail, then another mobile or robotic sensor will change the position, to satisfy good quality of information about monitored environment. This example is not applicable for static sensor. So in my work I also deal with plug and play feature of sensor motes, where I will be able to easily identify every sensor and use its all abilities. According to this example, one of goal is to create self-

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adaptable sensor network not only in sensor positioning, but also in sensor measurement range, extracting information, time sampling of sensor inputs and sensor behavior settings. This self-adaptation is process without human intervention and will be based on data analyses and artificial intelligent methods.

The well know technology M2M is used to operate action between sensors motes and gateways. This will facilities a data acquisition from the real physical world by sensors motes. Thanks to development of sensors management, the sensor network will be able to reach better quality of information in fast every situation (for example, if monitored value will exceed over measurement range). The self-adaptation of sensor network will lead to adaptation of sensor network to environment condition and needed data accuracy.

With this can be create an access point to sensor network, which will create a unified connection to the virtual representation of real environment, described by sensor motes.

2.1 Sensor motes

In my architecture I work with sensor motes, because they offer enough computational power to process data from sensors, separate information and are able to immediately communicate with other sensors, aggregation points, gateways, user computers, regular servers or cloud. The main thing in sensor is also reduction of communication, to save their power resource. I have already implemented an algorithm for sensor motes, which separate information from sensor data row, classify the information and create events.

2.2 Sensor gateway

This type of device in sensor network is head in management of sensors, but it is not only one the sensor network. To save low computation and power resource of sensor motes, the main management and analytic part of sensor network is implemented in gateways. They also create a unified connection from outside to the whole sensor network.