Centralized System for WSN for Distributed System

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Abstract: In this paper we are studying about centralaized system for WSN. This paper presents a review of centralaized system for WSN. WSN is consisting of tiny procedure equipped with sensing hardware, processing, transceivers and storage resources and batteries. However, WSN are deployed in open and indiscreet environment of the distributed system. These data of collected in the information is sent through wireles links using multiple hops to a sink or controller which could use it locally or additional transmits to other networks through a gateway. There is an node in sensor network consists of CPU, memory, battery, and transceiver. The central processing unit performs the data may be processing, memory stores data, battery provides energy, and they are transceiver receives and sends data. The Nods may be at a standstill or Moble, location-aware or location-unaware, homogeneous or heterogeneous.

***IndexTerms* – Network, Sensor, Wireless, Centralized, WSN.**

I. INTRODUCTION

The Nods in sensor networks can be individualy addressable or group-addressale in which the aggregated data is communicated. There are two types of WSN first, homogneous WSN and second, heterogeneous WSN. We have chosen heterogeneous WSN for our survy because there are following advantages of heterogeneous WSN:

1. Prolonging network lifetime
2. Improving reliability of data transmission.
3. Decreasing latency of data transportation.

Early study on WSNs mainly focused on technologies based on the homogeneous WSN in which all Nods have same system resource. However, heterogeneous WSN is becoming more and more popular recently. One of the important issues in sensor networks is power supply that is constrained by battery size, which normally cannot be enhanced. Thus, optimal use of the sensor energy has a great impact on the network lifetime [1]. This can be done either scheduling the sensor Nods to alternate between active and sleep mode or adjusting their sensing range [3].Power saving mechanism can be classified into two general ways: adjusting the transmission or sensing range and scheduling the sensor Nods to alternate between active and sleep mode [4, 5, 6 and 7].

One of the important issues in sensor networks is power supply that is constrained by battery size, which normally cannot be enhanced. Thus, optimal use of the sensor energy has a great impact on the network lifetime [1]. This can be done either scheduling the sensor Nods to alternate between active and sleep mode or adjusting their sensing range [2]. The techniques that help enhance network lifetime can be either centralaized or distributed. In former case, a single node has access to the entire network information that is used to determine scheduling. In the later case, a sensor can exchange information with its neighbors and that information is used to make scheduling decisions. The distributed algorithms require local (e.g., nearest neighbor) information due to limited memory, computing, and communiction capabilities of the sensors. Scheduling is a very important aspect for the network lifetime.

II. REVIEW OF WORK

Yuzhi Wang (2017) Temporal drift of sensory data is a severe problem impacting the data quality of WSNs (WSNs). With the proliferation of large-scale and long-term WSNs, it is becoming more important to calibrate sensors when the ground truth is unavailable. This problem is called "blind calibration". In this paper, we propose a novel deep learning method named projection-recovery network (PRNet) to blindly calibrate sensor measurements online. The PRNet first projects the drifted data

to a feature space, and uses a powerful deep convolutional neural network to recover the estimated drift- free measurements. We deploy a 24-sensor testbed and provide comprehensive empirical evidence showing that the proposed method significantly improves the sensing accuracy and drifted sensor detection. Compared with previous methods, PRNet can calibrate 2× of drifted sensors at the recovery rate of 80% under the same level of accuracy requirement. We also provide
helpful insights for designing deep neural networks for sensor calibration. We hope our proposed simple and effective approach will serve as a solid baseline in blind drift calibration of sensor networks.

E. Littwin (2016) WSN (WSN) is composed of a group of small and inexpensive sensors with the ability of sensing, measuring, data processing, and communiction. WSNs can gather information fro m the environment and transmit the collected data to users [1]. They have imprtant usage in many emerging applications such as environmental monitoring [2], smart cities [3], precise agriculture [4], etc. In recent years, mature WSN technologies have made it possible to deploy large-scale WSNs at an acceptable cost. In practice, many WSNs have hundreds of sensors deployed [2], [5].

Y. Wang and A. Yang, (2015) Existing blind calibration methods need special assumptions, such as the linearity of the data space and the sparsity of the drift, and also use pre-defined rules for feature extraction and sensor calibration [7]–[13]. On the contrary, PRNet has less application-related assumptions and can better utilize data correlations to calibrate drifted sensors with end-to-end learning approaches. Experimental results show that PRNet brings much higher recovery rate and lower calibration error compared with existing methods.

B.-T. Lee, S.-C. Son, and K. Kang (2014) Both simulated and real-world testbed datasets are used to evaluate PRNet. Experimental results show that, compared with the exsting SPSR-TSBL (subspace projection and sparse recovery with temporal correlated sparse Bayesian learning) method, PRNet can calibrate two times of drifted sensors at the recovery rate of 80% with the same level of accuracy. More benchmarks on generalization ability show PR Net can calibrate different types of drifts under noisy measureents.

Saddam Hossain (2013) 5G Technology stands for 5th Generation Moble Technology. 5G technology has changed to use cell phones within very high bandwidth. 5G is a packet switched wireles system with wide area coverage and high throughput. 5G technologies use CDMA and BDMA and millimeter wireles that enables seed is greater than 100Mbps at full mobility and higher than 1Gbps at low mobility.

Mohamed Labib Borham (2012) We propose a Modified distributd storage algorithm for WSNs (MDSA). WSNs, as it is well known, suffer of power limitation, small memory capacity,and limited processing capabilities. Therefore, every node may disappear temporarily or permaently from the network due to many different reasons such as battery failure or physical damage.

Peter Mell (2011) With continual advances in technology, coupled with increasing price/performnce advantages, wireles accessibility is being deployed increasingly in office and public environments. This paper discusses the security threats and risks associated with wireles networks, and outlines a number of best practices for deploying wireles networks in corporate and home environments. Finally, a set of security tips is provided for end-users surfing the Internet using public wireles networks.
networks.

J. J. Lotf, M. Hosseinzadeh, and R. M. Alguliev (2010) WSN (WSN) systems are typically composed of thousands of sensors that are powered by limited energy resources. To extend the networks longevity, clustering techniques have been introduced to enhance energy efficiency. This paper presents a survey on clustering over the last two decades. Existing protocols are analysed from a Quality of Service (QoS) perspective including three common objectives, those of energy efficiency, reliable communiction and latency awareness. This review reveals that QoS aware clustering demands more attention. Furthermore, there is a need to clarify how to improve Quality of user Experience (QoE) through clustering. Understanding the users' requirements is critical in intelligent systems for the purpose of enabling the ability of supporting diverse scenarios. User awareness or user oriented design is one remaining challenging problem in clustering. In additional, this paper discusses the potential challenges of implementing clustering schemes to Internet of Things (IoT) systems in 5G networks.

III. MATERIAL AND METHOD

We discuss different aspects of network model that include node types with their locations, their deployment strategies, and adjustable sensing range. Consider N sensor Nods that are distributed randomly and uniformly over the monitoring field. We assume the following:

- It is a static and densely deployed network in 2-D.
- Each sensor node has information about its neighbouring sensors and targets, besides its own IDs and position.
- Each sensor Nods has adjustable sensing range and its transceiver has the capability to change transmission power for different transmission ranges.
- The sensor Nods are assumed of three types: normal, advance, and super Nods are considered like in [17-19]. The super Nods have maximum energy but reciprocal in numbers and the normal Nods have minimum energy; hence reciprocal in numbers.

In this network model, the sensors are arranged in sets such that at any time only one cover set is active to monitor the environment and others are in sleep state to save the energy. The cover sets periodically become active according to monitoring schedule and that period is generally called reshuffle period. Initially, the super Nods cover the targets. In case some targets are not covered by the super Nods, then some of the advance Nods that can monitor uncovered targets become active Nods. If some targets are still not covered by super and advance Nods, then some of the normal Nods that can monitor the uncovered targets become active Nods. The network lifetime is obtained by adding the times of each monitoring schedule. The network lifetime is increased using ALBPS and ADEEPS by incorporating energy heterogeneity and different deployments strategies.

IV. COMPARISON BETWEEN HETEROGENEOUS WSN AND HOMOGENEOUS WSN

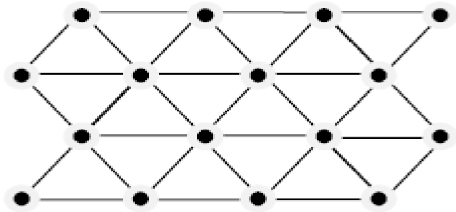
In homogeneous networks, all the sensor Nods are indistinguishable in terms of battery energy and hardware complexity. In homogeneous network, all Nods in the network share the same functionality where as in heterogeneous network all the Nods treated differently. Heterogeneous sensors more realistic in terms of their sensing and communiction capabilities in order to improve network reliability and extend network lifetime [14]. Also, an even if the sensor is equipped with the identical hardware but differs in sensing and communiction models. During manufacturing stage, two sensors may not use the same platform and similar physical properties. This constraint focuses on heterogeneity at the designing stage, when sensors are intended to have non identical capabilities to meet the specific needs of sensing applications. In the heterogeneous WSN, the average energy utilization for forwarding a packet from Nods to the sink will be much less than the energy consumed in homogeneous sensor network [15].

The problem of lifetime enhancement of WSNs is dealt with the adjustment of transmission or sensing range of the sensor Nods and implementation of heterogeneous energy model. In this work, we deploy the sensor Nods in 2-D using triangular, square, and hexagonal tiles. The initial energies of the sensors and their positions along with the positions of targets are known. For this environment, we investigate the maximum achievable lifetime using heterogeneous deterministic energy efficient protocol with adjustable sensing range (HADEEPS) and heterogeneous load balancing protocol with adjustable sensing range (HALBPS). We observe that deploying the sensors in triangular tiles gives better lifetime.

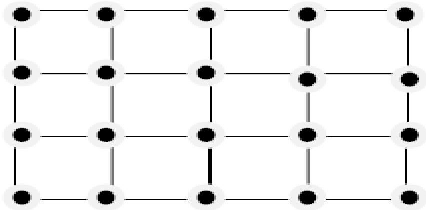
In [12], some mechanism is discussed to make sensors active. In this paper, the area left uncovered on removing a sensor is determined and it is termed as the sensing denomination (SD) of that sensor. Based on the location information of neighboring sensors, each sensor calculates its SD value in a distributed manner. The sensors with high SD have high probability of becoming active. If the cooperative nature of a sensor with its peers is considered, it leads to longer lifetime. This aspect has been addressed in [13] and named as multiple sensors to multiple targets (M-M) probabilistic target coverage problem. In M-M, multiple sensors cover multiple targets cooperatively and simultaneously with a given realistic detection probability threshold of each target. In [14,15,16], different deployments of sensors in 2-D are discussed, which include uniform arrangements in triangular, square, or hexagonal tiles and report that the triangular deployment is better as far as network lifetime is concerned. The network lifetime can be increased by providing energy heterogeneity to the sensors. The energy heterogeneity is addressed in [17,18,19]. These discuss 3-level heterogeneity models in which three types of sensor Nods: normal Nods, advance Nods and super Nods are considered. The advance Nods have more energy than the normal ones and the super Nods have more energy than the advance Nods. Their numbers are in reciprocal order because of the cost factor.

V. WSN NODE DEPLOYMENT STRATEGIES

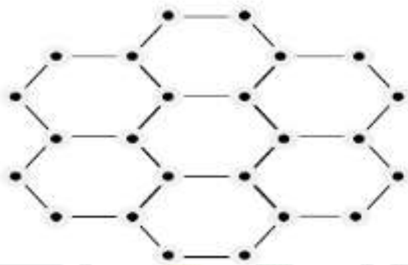
The lifetime of a network is highly dependent on the Nods arrangement that in turn affects energy consumption in WSNs.



(a) Triangular tiles



(a) Square tiles



(a) Hexagonal tiles

Fig. 1 uniform arrangement of the sensor Nods

There are several deployments/arrangements, but the most commonly used are triangle, square, and hexagonal in 2-dimensional region [14-16]. They are generally deployed manually by fixing the Nods in predefined locations to analyze for minimum energy consumption and hence the maximum lifetime of a WSN. Figs. 1(a)-(c) show deployment of sensor Nods in triangular, square, and hexagonal tiles [14-16].

VI. RESULTS AND DISCUSSION

The sensors will be deployed unattended and in large numbers, so that it will be difficult to change or recharge batteries in the sensors. Thus, optimal use of the sensor energy has a great impact on the network lifetime. In this paper, the network lifeti me has been improved by incorporating heterogeneity in the sensor Nods. Various techniques under adjustable sensing approach have been discussed to improve network life time, deployment cost and stability. We throw a light on HADEEPS and HALBPS approach to enhance the sensor network lifetime with different sensor arrangements. The discussion reveals as density of sensors increases the network lifetime also increases and maximum lifetime of network depends on sum of sensor lifetime.

Some of the covers are heuristically better than others for a sensor trying to decide its own sense-sleep status. This leads to various ways to assign priorities to the covers. The algorithms work by having each sensor transition through these possible prioritized cover sets, settling for the best cover it can negotiate with its neighbors. A local lifetime dependency graph consisting of the cover sets as Nods with any two Nods connected if the corresponding covers intersect captures the interdependencies among the covers. . Nods check to see if the area that they cover can be sponsored by their neighbors and they looked into a coverage-preserving node-scheduling scheme, which can reduce energy consumption, consequently increase system lifetime, by turning off some redundant Nods.

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