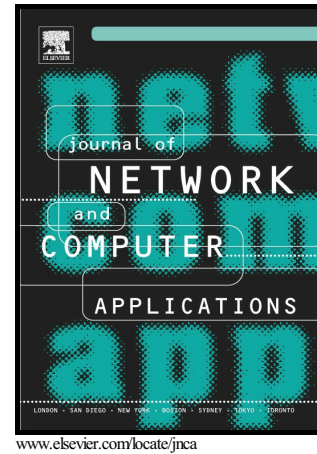


Author's Accepted Manuscript

Routing Protocols in Wireless Body Sensor Networks: A comprehensive survey

Fatima Tul Zuhra, Kamalrulnizam Bin Abu Bakar, Adnan Ahmed Arain, Mohsin Ali Tunio



PII: S1084-8045(17)30314-4
DOI: <https://doi.org/10.1016/j.jnca.2017.10.002>
Reference: YJNCA1982

To appear in: *Journal of Network and Computer Applications*

Received date: 3 June 2017
Revised date: 29 August 2017
Accepted date: 2 October 2017

Cite this article as: Fatima Tul Zuhra, Kamalrulnizam Bin Abu Bakar, Adnan Ahmed Arain and Mohsin Ali Tunio, Routing Protocols in Wireless Body Sensor Networks: A comprehensive survey, *Journal of Network and Computer Applications*, <https://doi.org/10.1016/j.jnca.2017.10.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Routing Protocols in Wireless Body Sensor Networks: A comprehensive survey

Fatima Tul Zuhra, Kamalrulnizam Bin Abu Bakar, Adnan Ahmed Arain, Mohsin Ali Tunio

Fatima Tul Zuhra¹(✉), Kamalrulnizam Bin Abu Bakar¹, Adnan Ahmed², Mohsin Ali Tunio³

¹Faculty of Computing, Universiti Teknologi Malaysia, Johor Bahru, Malaysia

²Department of Telecommunication Engineering, Quaid-e-Awam University of Engineering, Science & Technology, Nawabshah, Pakistan.

³Department of Electrical Engineering, MUET, Shaheed Zulfiqar Ali Bhutto Campus, Khairpur, Pakistan.

Corresponding Author: fatimatulzuhra86@gmail.com

Abstract. Wireless sensor technologies, especially Wireless Body Sensor Network (WBSN) or Wireless Body Area Sensor Network (WBASN), have gone beyond the fine-grained continuous monitoring platforms and became one of the enabling technologies that provide many successful applications in medical and non-medical field. The physiological monitoring systems are developed to monitor the human health issues and are responsible to route the sensed data (physical or vital information for instance, blood sugar, Electromyography (EMG), Electrocardiogram (ECG), Electro-encephalograph (EEG), temperature, etc.) from biosensors nodes to the medical or non-medical server for further analysis. Many routing and data dissemination protocols have been specifically designed for WBSNs. Routing protocols in WBSNs might differ depending on the application and network architecture. This paper present a comprehensive survey of state-of-the-art routing schemes in WBSN based on the recent standards and publications. First, we present the deep insight of WBSN and its related technologies. Next, distinguished characteristics of WBSN and its applications are discussed. Furthermore, routing issues and challenges are also explored as a source of inspiration towards future developments in WBANs. Based on the operational mechanism, existing routing protocols are classified as: temperature aware, QoS aware, security aware, cluster based, cross layered based and posture based routing protocols. Finally, various summary tables are provided that evaluates the efficacy of routing protocols in pursuit of design characteristics of WBSN.

Keywords: Wireless body sensor network, biosensor (sensor) nodes, physiological data, and routing protocols.

1. Introduction

The WBSN is a sub field of the Wireless Sensor Network (WSN). The main intention of the WBSN is continuously observing the health status of a person in order to generate an alarm when the critical condition is found. WBSN is able to communicate sense and process the physiological data (Ziaie and Najafi, 2001). It is formed by placing an intelligent biosensors inside or outside the human body surface that sense and accumulate the physical information (Itani et al. , 2016, Lai et al. , 2013, Miramontes et al. , 2017) from human body and transmitted to the base station for further processing (Lai, Liu, 2013, Sangwan and Bhattacharya, 2015) . Table 1 describes different sensors (commonly used in BAN systems) with their network topology, data rates and functions (Chen et al. , 2011, Lai, Liu, 2013). These biosensor nodes are simple, energy efficient, heterogeneous and cost effective and are placed on different parts of the human body (Sangwan and Bhattacharya, 2015).

Table 1: Biosensors with their network topology, data rates and functions.

Biosensors	Topology	Data rate	Functions (biosensors perform following tasks)
Accelerometer	Star/Mesh	High	Acceleration on all spatial axis in 3D space.
CO ₂ gas	P2P/Mesh	Very low	Oxygen concentration during human respiration and alterations in CO ₂ levels.

Download English Version:

<https://daneshyari.com/en/article/4955788>

Download Persian Version:

<https://daneshyari.com/article/4955788>

[Daneshyari.com](https://daneshyari.com)