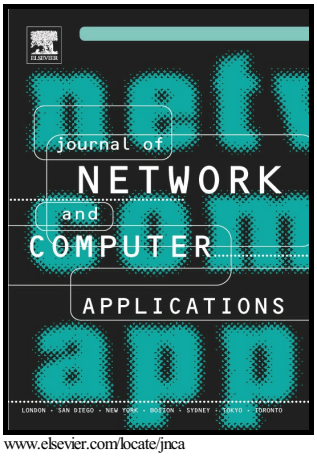
Preservation of Temporal Privacy in Body Sensor Networks

Abolfazl Diyanat, Ahmad Khonsari, Hosein Shafiei



www.elsevier.com/locate/jnca

PII: S1084-8045(17)30247-3
DOI: http://dx.doi.org/10.1016/j.jnca.2017.07.015
Reference: YJNCA1946

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

Received date: 16 October 2016
Revised date: 12 March 2017
Accepted date: 30 July 2017

Cite this article as: Abolfazl Diyanat, Ahmad Khonsari and Hosein Shafiei Preservation of Temporal Privacy in Body Sensor Networks, *Journal of Networ and Computer Applications,* http://dx.doi.org/10.1016/j.jnca.2017.07.015

Preservation of Temporal Privacy in Body Sensor Networks

Abolfazl Diyanat[a,b,*], Ahmad Khonsari[a,b], Hosein Shafiei[a]

[a] *Department of Electrical and Computer Engineering, University of Tehran, Tehran, Iran*
[b] *School of computer science in the Institute for Research in Fundamental Sciences, Tehran, Iran.*

Abstract

Wireless body sensor networks (WBSNs) are being widely adopted as a building blocks for today's medical monitoring systems. These affordable devices can effectively reduce the overall costs of medical operations and improve the quality of healthcare. Recent studies reveal that an adversary might trace the apparently insignificant traffic statistics of sensor nodes over the air and turn such data to invaluable information so as to breach the privacy of the victim sources. The preservation of patients' privacy is an indispensable requirement for such systems. Many aspects of privacy of these systems have already been studied in the literature. However, *context-oriented privacy* (especially temporal privacy) has gained less attention. Grounded in the queuing theory, in this paper, we present an efficient method based on time-dependent priority queue to maintain the privacy while preserving the delay constraints of the original packets intact without affecting the quality of service (QoS) parameters of the transmitted data. In this paper, we present an approach that guarantees the on-time delivery of messages while preserving the temporal privacy of messages. All of the theoretically obtained results have been validated conducting extensive simulation experiments.

Keywords: Wireless body sensor networks, Medical monitoring systems,

*Corresponding author
Email addresses: a.diyanat@ut.ac.ir (Abolfazl Diyanat), ak@ipm.ir (Ahmad Khonsari), h.shafiei@ut.ac.ir (Hosein Shafiei)