2014

User-Centric Privacy-Preserving Statistical Analysis of Ubiquitous Health Monitoring Data

Drosatos, George

ComSIS Consortium

Title:	**User-Centric Privacy-Preserving Statistical Analysis of Ubiquitous Health Monitoring Data?**
Year:	06/2014
Author:	George Drosatos and Pavlos S. Efraimidis
Abstract:	In this paper, we propose a user-centric software architecture for managing Ubiquitous Health Monitoring Data (UHMD) generated from wearable sensors in a Ubiquitous Health Monitoring System (UHMS), and examine how these data can be used within privacy-preserving distributed statistical analysis. Two are the main goals of our approach. First, to enhance the privacy of patients. Second, to decongest the Health Monitoring Center (HMC) from the enormous amount of biomedical data generated by the users' wearable sensors. In our solution personal software agents are used to receive and manage the personal medical data of their owners. Moreover, the personal agents can support privacy-preserving distributed statistical analysis of the health data. To this end, we present a cryptographic protocol based on secure multi-party computations that accept as input current or archived values of users' wearable sensors. We describe a prototype implementation that performs a statistical analysis on a community of independent personal agents. Finally, experiments with up to several hundred agents confirm the viability and the effectiveness of our approach.