**The k-unobservability: A new privacy protection guarantee for e-service systems**

**Abstract**

Privacy threats are considered as very serious issues in Internet-based applications such as e-services since there are good opportunities to malicious attacks. Protecting the user from being observed when requesting an e-service is a fundamental right that any user should have. The unobservability is among the basic privacy properties. However, most of the existing privacy preserving techniques has difficulties to achieve this property, and only a few of them use it in the context of mobile communications. In this paper, we propose a new privacy-preserving model, called k-unobservability that enables to achieve the privacy protection of e-service users. The model guarantees that the pseudonyms used to identify sensitive data contained in the user credentials, are related to no less than k actions (credential showings). Inspired from the efficient k-anonymity model, the k-unobservability provides a new guarantee of privacy protection in e-services. The experimentation results discussed in this paper, demonstrate the performance and applicability of our proposed model.