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Secure Computation on Encrypted Database

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Abstract

Google and Amazon have turned their huge infrastructure into a cloud computing environment and are aggressively recruiting businesses to run applications on their platforms. Many top-tier IT vendors have been promoting cloud computing as a new service model. However, serious concern has been raised about the security and privacy on such a service platform. Corporate users would need to protect their data running on the cloud computing platform from the "untrusted" service provider. Unfortunately, traditional encryption methods that aim at providing "unbreakable" protection are often not adequate because they are not designed to support applications to be executed on the encrypted data. In this seminar, the general problem of computing on encrypted data will be discussed. The key issue is how to balance the need on security and the requirement to perform computation. As a case study, the problem of k-nearest neighbor (kNN) computation will be used to illustrate a new model of secure computation on encrypted database.

Biography

Professor David Wai-lok Cheung is the Head of Department of Computer Science and Director of the Center for E-commerce Infrastructure Development (CECID) in The University of Hong Kong. He conducts research in database, data mining and e-commerce technologies. He was the recipient of the HKU Outstanding Researcher Award. Most recently, he received the Distinguished Contribution Award in the 2009 Pacific-Asia Data Mining and Knowledge Discovery Conference. He was the program chairman of the 2001 and 2005 Pacific-Asia Knowledge Discovery and Data Mining Conferences, the conference chairman of the 2007 PAKDD Conference. Most recently he is the conference co-chair of the 2009 CIKM Conference. Concerning applied research, he has received more than HK$60M grants from the Hong Kong Innovation and Technology Commission. His team at HKU has developed open-source ebXML gateway, which has been used by developers in e-commerce and logistics from more than 80 countries. The open-source product has received awards in various prominent competitions, including the Hong Kong 2004 IT Excellence Awards, the 2004 Asia-Pacific ICT Awards, and the 2005 Linux Business Awards.