Public Abstract

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Title:GEO-TAGGING AND PRIVACY-PRESERVATION IN MOBILE CLOUD COMPUTING

Mobile cloud computing, with the synergy between the cloud and mobile technologies, has brought us new opportunities to develop novel and practical systems such as mobile multimedia systems and cloud systems that provide collaborative data-mining services for data from disparate owners (e.g., mobile users). However, it also creates new challenges, e.g., the algorithms deployed in the computationally weak mobile device require higher efficiency, and introduces new problems such as the privacy concern when the private data is shared in the cloud for collaborative data-mining.

The main objectives of this dissertation are: 1. to develop practical systems based on the unique features of mobile devices (i.e., all-in-one computing platform and sensors) and the powerful computing capability of the cloud; 2. to propose solutions protecting the data privacy when the data from disparate owners are shared in the cloud for collaborative data-mining.

We first propose a mobile Geo-tagging system. It is a novel, accurate and efficient image and video based remote target localization and tracking system using the Android smartphone. Our system is first of its kind and we provide the first hand real-world experimental results showing that our system is feasible and practicable. Our system can be applied in various scenarios including military and commercial applications. To address the privacy concern when data from disparate owners are shared in the cloud for collaborative data-mining, we then propose a generic framework for privacy-preserving collaborative data-mining in which data-mining is performed in an encrypted domain. Our framework enables data-mining in the encrypted domain without decryption. Our framework enjoys higher scalability and lower complexity when compared to prior arts.