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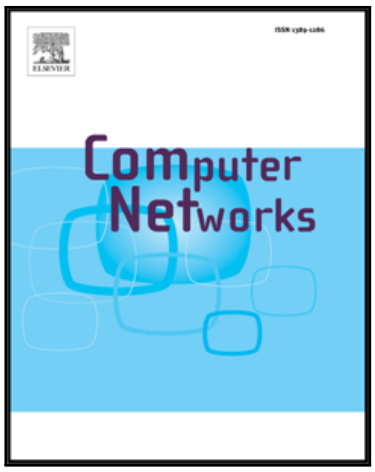

Privacy Preservation in Location-based Advertising: A Contract-Based Approach

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Privacy Preservation in Location-based Advertising: A Contract-Based Approach

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Abstract

Location-based advertising (LBA) is rapidly developing with the surging popularity of mobile devices and the advances in localization techniques. However, many LBA applications aggressively collect users' location data without providing clear statements on the usage and disclosure strategies of such sensitive information, which raises severe privacy concerns. Existing privacy preservation mechanisms normally require modifications at the user side or provide limited protection. To overcome these limitations, we propose an LBA system to leverage insensitive users to broadcast location-based ads to the privacy-sensitive users around them. To reward the privacy-insensitive users for delivering the ads, we design a number-reward contract scheme, in which a set of ad broadcast reward plans is offered to different insensitive users that select the most suitable plans based on their utilities. In addition, we derive optimal contract designs in both complete and incomplete information scenarios. Simulations are carried out to verify the theoretical analysis. The results show that a win-win situation is achieved, where every entity involved has an increased utility.

Keywords: Location-based advertising (LBA), Privacy, Contract Theory

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