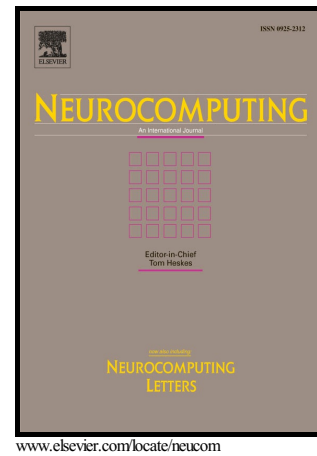


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Recommendation for Online Social Communities

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Efficient Privacy-Preserving Content Recommendation for Online Social Communities

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Abstract

In online social communities, many recommender systems use collaborative filtering, a method that makes recommendations based on what are liked by other users with similar interests. Privacy issues arise in this process, as sensitive personal information (e.g., content interests) may be collected and disclosed to the recommender server. Existing privacy-preserving collaborative filtering techniques trade either efficiency or accuracy for privacy, which are not suitable for online social communities with large amount of users. In this paper, we propose *YANA* (short for “you are not alone”), a user group-based privacy-preserving recommender system for users in online social communities. In this system, users are organized into groups with diverse interests and interact with the recommender server via interest-specific *pseudo users*, so that individual user’s personal interest information remains hidden from the server. A suit of secure multi-party computation protocols and recommendation strategies are proposed to protect user privacy from group members in the recommendation process. A prototype system has been implemented on both mobile devices and desktop computers, and evaluation using real-world data demonstrates that *YANA* can effectively protect users’ privacy, while achieving high recommendation quality and energy efficiency.

Keywords: recommendation, privacy, efficiency

1. Introduction

Online social communities have become an integral component of people’s daily lives, allowing users to easily create and share content with each other, and enjoy a variety of online applications and services on a real-time basis. Therefore, recommender systems that can accurately and efficiently identify and deliver interested content to individual users have become increasingly important. Many existing recommender systems [1, 2, 3, 4, 5, 6, 7, 8] adopt *collaborative filtering*

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