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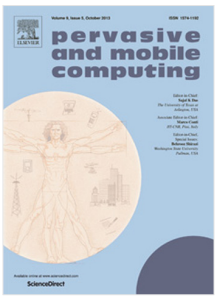

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Distinguishing Friends from Strangers in Location-based Social Networks using Co-location

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Abstract

This paper particularly focuses on using the spatiotemporal data in the location-based social networks (LBSNs) to infer the social tie between two users. To do so, we first generate a co-location dataset by simulating the meeting event between users based on the time difference and spatial distance. Subsequently, we extract four key features from the generated dataset: diversity, popularity, duration, and stability. We propose a framework called SCI (Social Connection Inference) that integrates all derived features to distinguish real friends' meetings from strangers' coincidental meetings. Experiment results based on the three LBSN datasets prove the effectiveness of the proposed SCI framework by outperforming the state-of-the-art methods. In addition, various discussions on different aspects of the data are presented in this paper to yield insights into using generated co-location datasets.

Keywords: location-based social network, data mining, social inference, feature extraction, co-location