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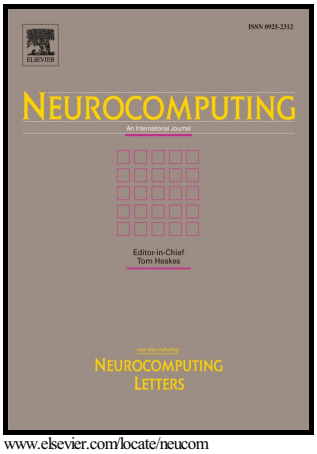

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Presenting New Collaborative Link Prediction Methods for Activity Recommendation in Facebook

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Abstract

One of the common methods used in recommender systems is collaborative filtering methods. In these methods, same-interest users' preferences are often recommended to each other based on examining their past interests. On the other hand, one of the recommendation methods in social networks is to measure the proximity of the two nodes in the graph. Although many researchers have dealt with friendship link prediction in different online social networks, very little notice has been spent on activity prediction based on different users' interactions. The main objective of this paper is the use of collaborative filtering methods for activity prediction and recommendation both for pairs of users without any interaction background and also for user pairs with the activity background. In this regard, a new concept is initially presented named as "collaborative path". Then based on the collaborative path, four directed proximity measures are proposed. In addition, three new algorithms, including two algorithms based on collaborative random walks, one for mixed network and one for multilayer network and the Collaborative-Association-Rule algorithm are presented. Finally, in order to evaluate our proposed methods, we perform some experiments on the data set of different Facebook activity networks including like, comment, post, and share networks. The results show that the proposed collaborative methods deal with the activity prediction well without suffering from the cold start problem, and outperform the existing state of the art methods.

Key words: Link Prediction, Recommender System, Facebook,

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