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**AN APPROACH FOR BUILDING EFFICIENT AND ACCURATE SOCIAL RECOMMENDER SYSTEMS USING INDIVIDUAL RELATIONSHIP NETWORKS**

**Abstract:**

Social recommender system, using social relation networks as additional input to improve the accuracy of traditional recommender systems, has become an important research topic. However, most existing methods utilize the entire user relationship network with no consideration to its huge size, sparsity, imbalance, and noise issues. This may degrade the efficiency and accuracy of social recommender systems. This study proposes a new approach to manage the complexity of adding social relation networks to recommender systems. Our method first generates an individual relationship network (IRN) for each user and item by developing a novel fitting algorithm of relationship networks to control the relationship propagation and contracting. We then fuse matrix factorization with social regularization and the neighborhood model using IRN's to generate recommendations. Our approach is quite general, and can also be applied to the item-item relationship network by switching the roles of users and items. Experiments on four datasets with different sizes, sparsity levels, and relationship types show that our approach can improve predictive accuracy and gain a better scalability compared with state-of-the-art social recommendation methods.