HETEROGENEOUS INFORMATION NETWORK EMBEDDING FOR RECOMMENDATION

Abstract:

Due to the flexibility in modelling data heterogeneity, heterogeneous information network (HIN) has been adopted to characterize complex and heterogeneous auxiliary data in recommended systems, called HIN based recommendation. It is challenging to develop effective methods for HIN based recommendation in both extraction and exploitation of the information from HINs. Most of HIN based recommendation methods rely on path based similarity, which cannot fully mine latent structure features of users and items. In this paper, we propose a novel heterogeneous network embedding based approach for HIN based recommendation, called HERec. To embed HINs, we design a meta-path based random walk strategy to generate meaningful node sequences for network embedding. The learned node embeddings are first transformed by a set of fusion functions, and subsequently integrated into an extended matrix factorization (MF) model. The extended MF model together with fusion functions are jointly optimized for the rating prediction task. Extensive experiments on three real-world datasets demonstrate the effectiveness of the HERec model. Moreover, we show the capability of the HERec model for the cold-start problem, and reveal that the transformed embedding information from HINs can improve the recommendation performance.