Embedded learning for leveraging multi-aspect in rating prediction of personalized recommendation

ABSTRACT

Collaborative filtering that relies on overall ratings has been widely accepted due to the ability to generate satisfactory recommendations. However, the most challenging difficulty of this approach is the lack of sufficient ratings or the so-called data sparsity. Moreover, sometimes these ratings alone are not sufficient to precisely understand users' specific behaviours. A user may show his/her overall preferences on an item through the overall ratings but at the same time, they may not satisfy with certain aspects of the item. This situation happened due to the emphasis on aspects that may be different among users and will effect a user's final decisions. Therefore, in this paper, we proposed a model called Neural Network model for Multi-Aspect with Strong Correlation (NNMASC) that utilize the significance of aspect's correlation to enhance the predictive accuracy of personalized recommendation. We integrate the user, item, aspects and overall ratings via embedding features by utilizing the available multi-aspect ratings from hotel reviews dataset. NNMASC adopts a feed-forward neural network with back propagation algorithm to make rating prediction. The experimental result using MAE shows that the proposed model has significantly outperformed the traditional models and the state-of-the-art approaches in terms of prediction accuracy.

Keyword: Recommender system; Collaborative filtering; Multi-aspect; Neural network; Correlation strength