Abstract

Collaborative filtering plays an important role in promoting the service recommendation ecosystem, and Matrix Factorization technology has been proven to be one of the most effective recommendation methods. However, the existing Singular Value Decomposition (SVD) methods usually initialize user and item feature randomly, not fully utilize the information of the data, so require plenty of experiments to determine feature matrix dimension, which causes overfitting problem in sparse rating matrix with low convergence efficiency and low accuracy.

This Project work proposes initialization method based on genres mapping with Modified singular value decomposition method to solve these problems. Which consists of three parts firstly use the number of item genre types to determine feature matrix dimension in order to avoid multiple experiments to select the optimal dimension value. Secondly use K Nearest Neighbors algorithm with person correlation coefficient to map similar users and items efficiently. Finally adopt regularization term to SVD for reduce overfitting problem.

By testing our method on Movielens 100k, the experimental results show that compared with the traditional method, the proposed method achieves a significant improvement in recommendation accuracy.