Abstract

The continued development of the concept of online sales in Indonesia increasingly makes the business opportunities rollicking to use e-commerce to conduct transactions. With so many e-commerce users this causes the information received by buyers to be very large, so online businesses will have difficulty in promoting the right product to the right target buyer. To increase product sales in e-commerce, a recommendation system is an answer to this problem. In this study, the authors conducted a study of the product recommendation system in e-commerce using a gradient descent-based factorization matrix method. This study includes the implementation of a gradient descent-based factorization matrix method for e-commerce product recommendation systems and calculating the performance of methods for data that have a sparsity level above 98%. From experiments conducted on two Amazon product datasets, the optimal parameter for learning rate is 3×10^{-4} with the number of latent features = 20 and regularization parameter = 0.4, so that the average value of Root Mean Square Error (RMSE) accuracy is obtained at an optimal condition of 1.1621 for the category of electronic products and 1.1148 for the category of food products. These results indicate that the matrix factorization method based on gradient descent provides a good level of accuracy in recommendation systems that have a high level of data sparsity.

Keyword : product recommendation system, e-commerce, factorization matrix, gradient descent, data sparsity