E-Learning Recommender System Based on Collaborative Filtering and Ontology

Authors : John Tarus, Zhendong Niu, Bakhti Khadidja

Abstract : In recent years, e-learning recommender systems has attracted great attention as a solution towards addressing the problem of information overload in e-learning environments and providing relevant recommendations to online learners. E-learning recommenders continue to play an increasing educational role in aiding learners to find appropriate learning materials to support the achievement of their learning goals. Although general recommender systems have recorded significant success in solving the problem of information overload in e-commerce domains and providing accurate recommendations, e-learning recommender systems on the other hand still face some issues arising from differences in learner characteristics such as learning style, skill level and study level. Conventional recommendation techniques such as collaborative filtering and content-based deal with only two types of entities namely users and items with their ratings. These conventional recommender systems do not take into account the learner characteristics in their recommendation process. Therefore, conventional recommendation techniques cannot make accurate and personalized recommendations in e-learning environment. In this paper, we propose a recommendation technique combining collaborative filtering and ontology to recommend personalized learning materials to online learners. Ontology is used to incorporate the learner characteristics into the recommendation process alongside the ratings while collaborate filtering predicts ratings and generate recommendations. Furthermore, ontological knowledge is used by the recommender system at the initial stages in the absence of ratings to alleviate the cold-start problem. Evaluation results show that our proposed recommendation technique outperforms collaborative filtering on its own in terms of personalization and recommendation accuracy.

Keywords : collaborative filtering, e-learning, ontology, recommender system

Conference Title : ICWAIM 2017 : International Conference on Web-Age Information Management

Conference Location : Venice, Italy

Conference Dates : February 16-17, 2017