

Personalized Recommendation of Learning Resources

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Personalized recommendation plays important role in wide variety of fields nowadays. Its main purpose is to deliver the most relevant content to each user in specific scenario. The library users would like to get recommended books according to their taste, the researchers would like to get papers in their field of study and the shoppers like to be offered goods to buy according their actual shopping purpose. It has been done a lot of research in this field including various recommendation techniques – content based recommendation, collaborative recommendation and many others approaches combining these two or inventing other new methods [1].

An interesting field for personalized recommendation arises in the field of education, where it is important to recommend study materials to achieve better study results and enhance whole learning process. This domain is very specific mainly regarding the process of choosing relevant study materials for recommendation, because the main focus here is not to fulfil individual satisfaction of the user but to help him to learn more effectively and achieve better results in shorter period of time. To take it even further, it is very challenging to recommend for groups in collaborative learning. Collaborative learning helps the students to better understand of the subject of study by letting them to interact and share their thoughts. In collaborative learning it is easier to cover bigger areas of study and advance faster as in individual learning, because diversity of individuals' knowledge in the group makes it necessary to discuss various matters and therefore enhance the whole group's understanding.

We propose a method for group recommendation in educational systems utilizing users' learning style in the process of group creation and recommendation itself. We use layered user-model reflecting user's knowledge and knowledge spreading proposed in [2] and we enhance it with user's learning styles defined in [3] that we get from the questionnaire. The learning styles represent the user's cognitive style in four dimensions: perception (sensing/intuitive), input (visual/verbal), processing (active/reflective) and understanding (sequential/global). The learning styles are then

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used to prioritize student's preferences in process of calculation of learning resources' suitability for recommendation where we take into account that various learner- types have various tolerance for difficulty, concept skipping and repetition. The suitability of learning object is calculated as a minimum of three measures:

1. suitability of concept for further recommendation according to its difficulty and prerequisites fulfilment,
2. suitability of learning object difficulty,
3. suitability of repetition of learning objects.

In the end we proposed a hybrid approach to aggregate single students' recommendations for group recommendation. This approach combines the least distance and average value measures when aggregating single user's recommendation according to the variance of recommended items.

Because communication in collaborative learning is very important we take this matter into account and help to allow the students communicate within their group online directly in the educational system. We plan to evaluate our method live on real users in learning system ALEF [4].

Extended version was published in Proc. of the 9th Student Research Conference in Informatics and Information Technologies (IIT.SRC 2013), STU Bratislava, 37-42.

Acknowledgement. This work was partially supported by the Scientific Grant Agency of Slovak Republic, grant No. VG1/0675/11.

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