

Group Recommendation for Smart TV

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Domain of multimedia content belongs to the popular fields of human interest. Multimedia content brings us knowledge, fun, relax etc. Average people spend daily multiple hours by watching TV or videos on the internet. Thus it is very important what people watch because it constitutes a significant part of their free time and the daily information income.

Due to the big interest for multimedia content, there is a big offer too. Nowadays in TV or on the internet available huge number of data. This situation brings to people information overload problem which still grows. This cause, that people easily find some content to watch but it is difficult for them to find something that will they like.

There were involved multiple ways how to help users with described problem. One of the most effective ways is the personalized recommendation, which is based on automatic selection of most interesting content individually to each user. There are multiple known types of personalized recommendation: collaborative, content based, demographic, knowledge based etc. These pure approaches are fairly good known and there exist many experimental researches describing their strong and weaker features. A good overview can be seen, for example, in work of O'Connor et al. [3].

Personalized recommendation is, in all of its variations, based on some kind of user model. User model represents content or its features, that user interacted with in past. Domain of multimedia content is in common considered as well structured, so we can fairly good describe items by its metadata. In the field of personalized recommendation however, exists along well known pure recommendation approaches a fewer scouted part, named hybrid recommendation. Hybrid symbolizes, in this meaning, any method combining by some way multiple pure recommendation methods. These can use different ones or even similar recommendation approaches [1].

In our research, we focused on mixed hybrid method combining collaborative and content based approach. We choose this combination due to its complementarity. For new user faces pure collaborative approach to the cold start problem, because it cannot find the appropriate similar users. Pure content based approach achieves the

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lower precision and cannot help user to find something without his/her majorly preferred domain. In combination, can these two approaches achieve the result, which is better than results of methods used alone.

Our method is composed from two steps. In first of them are suitable items chosen by collaborative method, which uses to recommend the power of user community. This is, in common, known as the very effective way of finding items to recommend. The main advantage is that quality content was filtered by other users who have similar preferences to target user, so there is a low chance to choose some uninteresting content. Collaborative recommendation reaches in common good results, when there are enough users in system and we know target user preferences well [4].

In the second step our main process we change the order of results from collaborative approach based on similarity level of these items to items which user watched before. Similarity level is determined on the basis of content based approach results. Advantage of content based recommendation is the, that we can determine the similarity measure between some item and user preferences based on his/her past activities [2]. This is different to collaborative recommendation, where we cannot say anything about the suitability of some item to user preferences.

Proposed hybrid recommendation method reaches for single users the higher precision, compared to pure collaborative and content based methods. The highest difference can be seen on top positions of results. This means that idea of reordering the results works. This is in fact quite important in domains such as watching movies or TV, due to the long duration of its items. There is common that user watches only one or few items, so is better to offer him 1 very suitable item than the 15 tolerable.

Our next aim is to evaluate proposed recommendation method on groups of multiple users. In domain of movies, TV or another multimedia content is common that multiple users consume the same content together in the same time. We are social beings and for this reason will we rather tolerate content that does not completely suit individually to us, but which is acceptable for whole group. This trait of humanity deserves to be supported by personalized recommendation.

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