

# A Smart TV Application for Personalized Recommender Services

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**Abstract.** With the TV channel explosion, many people face an exhausting task of having to find something to watch on TV that fits their interest. Despite the excessive increase of TV contents, there are few considerations in the development of novel methods for personalized smart TV content recommender services. In this paper, we define an application architecture of personalized TV content recommender service. In addition, for the personalized recommender service, we consider the use of user's context data increasing the user's satisfaction about the recommender service.

**Keywords:** Smart TV application, recommender system

## 1 Introduction

Recently, the TV contents recommender system has recently been issued due to the diffusion of Smart TVs and TV-related content explosion. The major motivation for the realization of the TV contents for each user from a large number of available selections. Recent many studies have proposed a collaborative filtering-based TV contents recommender systems [1]-[3]. The major feature of these studies is based on a user history of past viewing data. Recommendations are provided by matching the prediction of user's preferences with TV contents. In other words, TV contents that are similar to those the user preferred in the past are recommended. Therefore, CF-based TV contents recommender systems completely rely on profiles of viewers and TV contents respectively. In this paper, we propose the context tagging-based user's preference prediction mechanism by extending the widely known recommender algorithm, collaborative filtering (CF). Our proposed mechanism solves common problems of CF-based systems. In addition, the prediction of user's preference on TV contents are more accurate than existing recommender systems.

## 2 Related Works

Among previous TV contents recommender systems, the TV advisor developed by Das and Horst makes use of explicit techniques to generate recommendations for a

TV viewer [4]. Milan Bjelica determined the most important factors of a TV contents recommender and proposed an analyzing model for the estimation of user interest based on a content-based approach [5]. SeungGwan Lee et al. suggested a personalized TV contents recommender system for the cloud computing environment [6]. These studies are based on a content-based approach involving contents and user attributes (actor, genre, running time, program title, time, and date) of contents viewed by each viewer in the past. Ana Belen *et al.* took a hybrid content-based and item-based collaborative filtering approach to recommend TV contents [7].

But these previous researches which commonly consider recommender techniques require the user to take the initiative and explicitly specify their interest, in order to get high quality recommendations causing TV viewer's inconvenience. Besides, they have few consideration about solving widely known recommender problems, *grey-sheep* and *cold-start* which are main cause of .reducing the performance of recommender systems. In this paper, we aim to solve these problems of recommender techniques by extending CF techniques.

### 3 Personalized Smart TV Contents Recommender Service

Fig. 1 presents overall architecture of personalized smart TV recommender system.

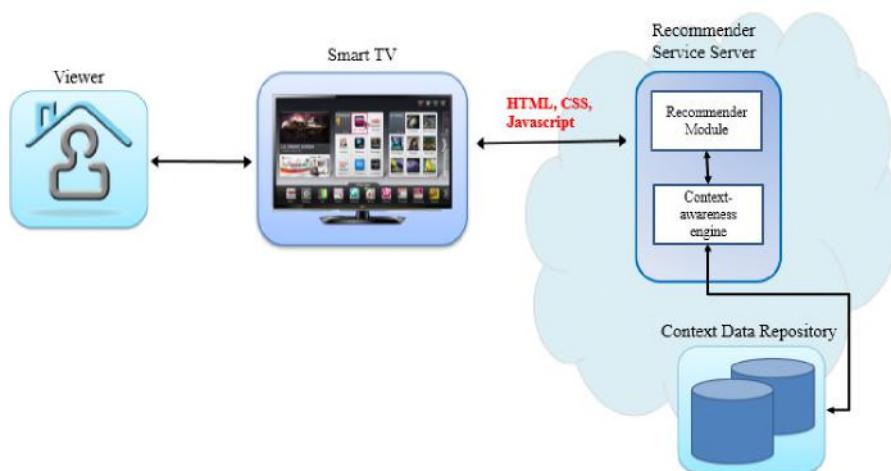


Fig. 1. The architecture of the personalized TV content recommender system

The architecture of developed prototypes consists of a Recommender Service Server and Smart TV Application. Smart TV Application sends current viewer's ID to *recommender service server*. Then the *context-awareness engine* in the *recommender service server* calculates the situation similarity based on data which are stored in the *context data repository*. The *recommender module* composes recommendations which are proper with a certain TV viewer's current contexts through Internet. A viewer can interact with the smart TV recommender application through a HTML5 enabled

browser and the smart TV application is connected to Internet with back-end recommender system implemented with web technologies such as Ajax or XML programming.

#### 4 Conclusions and Future Works

Recently, the TV contents recommender system has recently been issued due to the diffusion of Smart TVs and TV-related content explosion. The major motivation for the realization of the TV contents for each user from a large number of available selections. In this paper, we defined the service architecture of personalized TV content recommender systems. Also, we considered context-awareness-based recommendation engine in the defined architecture increasing the user's satisfaction about the recommender service. In the future, we will propose novel recommender algorithm applied in the recommender engine of the proposed architecture. Also, we will develop the prototype service of recommender system in order to certify the usefulness of the architecture proposed in this paper.

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