ABSTRACT
The paper presents an approach to merge Web 2.0 and adaptation with TV contents in order to enrich the user experience. We present iDYNamicTV, a social Web-based recommender system dealing with multimedia contents. iDYNamicTV is part of a larger project by Telecom Italia (DynamicTV) for enhancing user experience in TV fruition. The goal of iDynamicTV is to provide facilities to entertain when exploring and discovering media contents on the Web using a computer interface.

Categories and Subject Descriptors
H.5.1 Multimedia Information Systems
H.3.5 Online Information Services

General Terms: Design, Human Factors

Keywords
Interactive television, Web 2.0, social applications, adaptation

1. INTRODUCTION
The joining of Web 2.0 and interactive television is an interesting emerging paradigm. The term Web 2.0 refers to a second-generation of Internet-based services that let people collaborate and share content online [6]. Users can annotate contents by adding keywords (tags) or additional information, thus creating folksonomies, and share them with other users which have similar interests. However, Web 2.0 alone does not provide mechanisms powerful enough to cope with the problem of managing the huge amounts of available contents. Adaptive Web systems [3] have the goal of tailoring the selection of resources, the presentation of contents and the navigation structure to the model of each specific user and context of usage.

Since Web 2.0 and adaptation share both a user-centric approach and the purpose of creating a personal fruition experience, their principles can be integrated. On the one hand, adaptation can benefit from Web 2.0 since user participation can be exploited to learn about the user and to improve her user model. On the other hand, Web 2.0 can benefit from adaptation since the information in the user model can be exploited to help the user in tagging and creating contents. When specifically applying to TV content on the Web, the personalization of TV contents enriches the content fruition. Second, the idea of a decentralized production of TV contents creates novel user experiences. Finally, social tagging offers new opportunities for the creation of communities of TV spectators joining all users that share common tags. In this paper we describe iDYNamicTV, a social Web-based recommender system which is part of a larger project by Telecom Italia (DynamicTV) for enhancing user experience in TV fruition. DynamicTV introduces a new interactive paradigm, the so-called Inter-tainment paradigm [7] in which exploration of contents becomes an entertainment experience. The goal of iDYNamicTV is to further boost such paradigm, providing a number of other facilities to entertain users when exploring and discovering TV contents on the Web using a computer interface, creating a continuum between the two media. iDYNamicTV combines user modeling, adaptation and recommendation to the individual user, social networking, and creates both a personal and a social space of fruition.

2. BACKGROUND AND RELATED WORKS
In the last years, the introduction of new broadcast technologies as IPTV, DVB-H and DTT led to a considerable increase in television contents that can be watched not only on the traditional TV set but also through PCs and mobile phones. Several projects aim at improving the user experience by exploiting such new opportunities. Some studies focus on the realization of alternative ways of interaction with the TV set, creating innovative interfaces to improve traditional EPGs [8] and enhancing the user experience by adding some interactive features such as rating [5]. Other works have introduced personalization and recommendation into TV experience [1]. Finally, some projects enrich TV user experience with the introduction of Web 2.0 features: the possibility for the user to create her own channel or send recommendations to a friend (i.e. Babelgum1, Joost2) or import social networks from the Web to TV [2].

1 http://www.babelgum.com
2 http://www.joost.com
3. iDYNAMIC TV: INTER-TAINMENT ON THE WEB

In this section we analyze the main distinctive features of iDYNaMicTV: user participation, adaptation and social networking.

User participation. Registered users can either post new contents or enrich the published ones with ratings, comments, tags and further information, as well as bookmark them. Thanks to user participation, the application knowledge bases broaden their scope and are able to integrate niche contents, usually not covered by official sources. Moreover, tags and information inserted by users help to improve the set of metadata of a content.

Tagging. Users can mark contents with tags. A tag cloud is associated with each video. Tags can link contents and provide a way to navigate through them, supporting a form of serendipitous discovery. Tagging can also be used to update the user model: the application can exploit the user tags in order to infer some features, e.g. her interest in the tagged item [4].

User-Generated Contents. Users can add missing textual metadata (e.g. original title) or uploading semi-professional contents. iDYNaMicTV supports users in creating contents, by means of a mechanism for bookmarking videos fragments, and a simple video editing tool for creating personal mashups.

Adaptation. iDYNaMicTV maintains an explicit model of each user, keeping track of her interests and preferences, in order to offer personalized recommendations of contents. The model is continuously updated and revised by tracking the user’s behaviour. A user can also define herself using a set of tags: in this way tags do not only support navigation in the space of contents but also in the space of users. From such data the system can infer different types of information about the user, such as her interests in the categories of videos and on each specific item. At any time the user can inspect her model (scrutable user model) and change parts of the values if she does not agree with them. Content personalization follows the cognitive filtering approach by means of an intelligent agent that relates the user model to the categories, also taking into account the ratings of each video. In addition, an “adaptive” annotation technique, making use of coloured thumbs-up icons, is used to make the recommended items still more prominent [3].

Social networking. iDYNaMicTV exploits relationships among users in order to promote television contents and to allow users to share their experiences, in a sort of “Word of Mouth Adaptation”, where users recommend contents to others. This is very useful since people often prefer to receive recommendations from friends or trusted and similar users, rather than from an “anonymous” system. To this end, users can explicitly get in touch with each other and exchange information, as well as navigate the personal space of other users (with information about favourite contents and users). Different types of user networks are also available, each representing new opportunities to explore and discover contents:

Network of friends: Users are automatically alerted if their friends interact with the system.

Network of similar users. Given the user models, the system can compute a degree of similarity between users and form groups of similar users.

Leading users. We distinguish a number of leading roles: active users, who introduce contents or tags and comments; trusted users, whose contents are frequently explored and positively rated; opinion leaders, the most active and trusted users.

Network of on-line users. A user can discover which users are connected at a given time.

Tag-based networks. Starting from a tag users can discover not only television contents related to the tag but also users that used it to define themselves.

4. CONCLUSION AND FUTURE WORK

iDYNaMicTV is an experiment to show how new dimensions can be added to the Inter-tainment paradigm by exploiting the combination of Web 2.0 and user-model based adaptation. As next steps, new opportunities of personal navigation in TV space will be investigated, as well as the possibility to exploit tagging for the creation of social networks. Finally, we will concentrate on defining an integrated interaction model between the TV and Web application, supporting a stronger cross-media interactive TV.

5. REFERENCES


