New model to recommend media content according to your preferences

May 13 2013

Researchers at the Technical University of Madrid (Universidad Politécnica de Madrid) have developed a model capable to recommend audiovisual content to each user based on their own media consumption and intrinsic features of images and videos.

The recommendations generated by the new model, developed by the Visual Telecommunications Application Group (G@TV) of the Higher Technical School of Telecommunications Engineering of the UPM, can be produced without prompting the user and without bothering them when they are watching and enjoying the content. The system has been tested with over 70,000 users and a million of content evaluations. According to the findings, the model has the highest precision so far.

The vast proliferation of Internet content, television and other media can prevent user from obtaining those contents which are interesting to them. In order to ease this selection, researchers at the UPM in collaboration with leading media companies, have developed a model that allows them to recommend highly reliable content. The testing was carried out with a high number of users in different scenarios such as the Olympic Games, online game catalogs or digital interactive television.

The traditional recommender system usually use: semantic techniques which result in products defined by themes, similar tags to the user interests, algorithms that use collective intelligence of a large set of user, in a way that this traditional system recommends themes that suit other people with similar preferences.

From this knowledge state, an applied model of [multimedia content](#) that goes beyond this paradigm has been developed, and it incorporates other features of whose influence, the user is not always aware and because of that reason has not been used so far in these types of systems.

Therefore, researchers at the UPM have analyzed in depth the audiovisual features that can be influential for users and they proved that some of these features that determine aesthetic trends and usually go unnoticed can be decisive when defining the user tastes.

For example, researchers proved that in a movie, the relative information to the narrative rhythm (shot length, scenes and sequences), the movements (camera or frame content) or the image nature (brightness, color, texture, information quantity) is relevant when cataloguing the preferences of each piece of information. Analogously to the movies, the researchers have analyzed images using a subset of descriptors considered in the case of video.

In order to verify this model, researchers used a database of 70,000 users and a million of reviews in a set of 200 movies whose features were previously extracted.

These descriptors, once they are standardized, processed and generated adequate statistical data, allow researchers to formally characterize the contents and to find the influence degree on each user as well as their preference conditions.

It is important to highlight that the recommender does not feed from declared explicit preferences by the user, but these preferences are dynamically changing according to their consumption trends. To this effect, researchers created a probabilistic model that infers the patterns by using artificial intelligence techniques. The model were validated by doing tests with real users whose television consumption were assessed

for a while and contrasted with surveys

After statistical analysis of the results and their relationship with the diverse content categories, they proved that these implicit methods that use consumption data are more reliable than the data from explicit ratings because they used objective measures and allowed them to remove social and cultural conditioning that affect some contents.

Once the user preferences and the nature of content are set, the system is able to generate new recommendations by exploiting this data. To do this, it was important to take into consideration the conclusions drawn from the influence of the aesthetic and the need to create personalized statistic systems in a way that the criteria for recommendation can change for each user according to the influence of these features.

As this study has proved, some users show a special sensitivity to certain features, especially the ones related to mounting rhythm or the camera motion. The recommendation algorithm justifies its success by using information that the user is not aware that he knows, but it is able to determine a special aesthetic affinity with specific audiovisual contents.

The model was developed and validated in diverse real systems based on research on European projects (ARENA), national projects and applied to various scenarios: generalist television scenario (3SME), Web scenario applied to search engines (Buscamedia), TV and web hybrid scenario applied to the Olympic Games, and scenarios of multiplatform audiovisual consumption (Mireia).

  More information: Sanchez, F. et al. Social and Content Hybrid Image Recommender System for Mobile Social Networks, *Mobile Networks and Applications*, vol. 17, issue 6, pp 782-795, 2012.

Sanchez, F. et al. Recommender System for Sport Videos Based on User