Enhancing Media Personalization by Extracting Similarity Knowledge from Metadata

The world of media today can be characterized by us being exposed to vast amounts of content, both produced professionally and user generated. Ever since the digital technologies in the form of computers and video cameras have diminished the production costs and the Internet has significantly lowered the costs of distribution, we became more and more overwhelmed with the choice of media. In such conditions the focus falls on the available mechanisms to filter and recommend media to users, thus resulting in the growing need for personalization. Media personalization is a complex process with many interrelated parts – recommendation engines, content metadata, contextual information and user profiles. In the center of any type of recommendation lies the notion of similarity. The most popular way to approach similarity is to look for the feature overlaps. This results often in recommending only “more of the same” type of content which does not necessarily lead to the meaningful personalization. Another way to approach similarity is to find a similar underlying meaning in the content. Aspects of meaning in media can be represented using Gardenfors Conceptual Spaces theory, which can be seen as a cognitive foundation for modeling concepts. Conceptual Spaces is applied in this thesis to analyze media in terms of its dimensions and knowledge domains, which in return defines properties and concepts. One of the most important domains in terms of describing media is the emotional one, especially when we talk about the contents of music. Therefore the main focus in the thesis is how to extract such emotional information from media, and how to use it to enhance media personalization. This dissertation proposes a novel method to extract emotional information from text (unstructured metadata) using Latent Semantic Analysis (one of the unsupervised machine learning techniques). It presents three separate cases to illustrate the similarity knowledge extraction from the metadata, where the emotional components in each case represents different abstraction levels – genres, synopsis and lyrics. The emotional value is extracted by first creating a conceptual space for emotions based on a semantic differential which divides the underlying plane along two psychological dimensions – arousal and valence. Then the space is divided into regions serving as emotional markers – a selection of affective terms. After that LSA is used to calculate the cosine similarity between the text (synopsis or lyrics) and each of the chosen affective terms. As a result we can plot emotional correlation in the content as patterns, which we can then use to find emotional similarity among media items. By being able to compare media items on the basis of their emotional patterns, we add a new level to how we can evaluate the similarity between two media items. Which in return might improve media recommendation since it provides a novel approach to recommendation that goes beyond traditional genre boundaries, and thereby improves media personalization.

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