

Recognizing User's Emotion in Information System

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Human emotions and their signs are innate to humans, regardless to the particular person. Thanks to that they can serve as implicit feedback from the users in information systems. Mimics of the face are unconscious signs of reaction to affect. According to a number of researches in the area of psychofeedback different movements of the face are common for all people, so we can derive reasons if these reactions – emotions. In case of education systems we can estimate the users' opinion about text from the face mimics, so we are able to find out knowledge, interests, mood and other attributes that wouldn't be possible to identify by the help of traditional ways of gaining feedback.

In this project we deal with gaining, representing and utilizing of user emotions while using web-based (education) system. To find out, what is on the subject's mind, we need to have a camera that records the user's face. For the extraction of emotions from video we can use a number of existing tools, which are able to recognize human face and its facial features. Facial features are important points of human face (e.g. border of mouth or eyes). Their location depends on the movements of facial muscles therefore on the emotions of the user.

Our aim is to propose a method for user modeling based on emotions invoked during work in web-based (education) system. Our method is going to be based on results of experiment we plan to realize in real environment with users. Within the experiment we will track the users by a webcam while they are working in the selected system. By comparing of extracted emotions with users' activities we will try to explore relations between psychological activity and executed actions in user interface. The goal of the experiment is to identify activities or their groups specific for users in certain emotive state. This way we will be able to find out emotions invoked by given content by traditional types of feedback.

We plan to deploy our emotion recognition method in an existing adaptive E-Learning system and it will be utilized for enriching of the user model. One of the most

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important metadata in user model of such an information system is the users' knowledge level regarding different topics, so we try to contribute to estimation of these values. To achieve this we have to find the way of deriving knowledge from emotions. For this reason we prepare a set of short texts (stories, news, parts of curriculum etc.) and a sequence of questions according to each text that will be read and answered by users within the experiment. By comparison of users' answers and their emotions we could identify relationship between emotion and knowledge level.

The output of our method will be a conceptual map that represents the relationship between content visited by the user, the emotions invoked by the content and the user's knowledge level. The model could be utilized for collaborative filtering by traditional way – estimating similarity between users or items, calculating relevancy level of given content for the user. The relevancy level could be expressed either by knowledge or emotional state – for users in certain emotional state should be recommended items by similar emotional character. Another way of utilizing of the model is adaptive teaching (selecting the proper level of explanation depending on the user's reactions in real time) or adaptive testing (selecting a question of proper level depending on user's reaction to the previous question).

Thanks to the environment which the method will be deployed in we have a good opportunity to evaluate it. Since we want to estimate users' knowledge by the help of implicit feedback, we can easily check the precision of estimation. By asking users some questions according to the content that has been already modeled we can compare implicit and explicit feedback, so our method could be evaluated.

Acknowledgement. This work was partially supported by the Slovak Research and Development Agency under the contract No. APVV-0208-10.

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