

FMC: A new method for predicting user satisfaction using a facial movement curve based on 68 facial landmarks features

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ABSTRACT

User experience (UX) evaluation aims to measure the user's ability to learn and use a product or service that effectively meets user expectations, needs, and values. One UX evaluation method is to observe the user's feelings or reactions during usage; this helps to understand their experience of its positive and negative aspects without their awareness, and thus without user bias. Because users usually change their feelings during usage, evaluating a user's emotional state during product usage through user expression appears worthwhile.

Facial movement is a nonverbal communication method. Facial movement can convey both a message as well as the feelings of the communicator. For example, most people worldwide can easily recognize and use facial movements to depict their own internal emotional states. As examples, they smile when they feel happy and scowl when they feel anxiety and panic. Facial movement data could reflect the users actual feeling when using a product or service. Consequently, we assume that facial movement during the use of products or services may directly affect a final user satisfaction, which is the user experience that the product owner wants to know. The relationship between facial movement data and satisfaction data remains challenging to measure and its relevance is difficult to characterize. Further, the use of human labor to explain and analyze this relationship is not easy.

Several papers used the seven emotion state features of facial expression recognition (FER), namely neutral, joy, sadness, anger, disgust, fear and surprise to predict a final user satisfaction. However, the previous researches assumed that some kind of emotion is same as the user satisfaction, for example, joy is the user satisfaction or UX.

In this study, we found that facial landmarks features are essential in physical expressions and provide abundant information. The aim of this study is to propose a new method for predicting user satisfaction as UX during the use of particular products or services. This method used the facial movement curve (FMC) based on 68 facial landmarks features to obtain momentary UX data. We used machine learning techniques to predict final user satisfaction from users' FMC.

Keywords: Facial Movement, User Experience, Machine Learning, Final User Satisfaction.