

Title	表情分析によるストレス解消効果を高める画像提示順序の決定法
Author(s)	井戸田, 彰義
Citation	
Issue Date	2017-03
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/14096
Rights	
Description	Supervisor:宮田 一乗, 知識科学研究科, 修士

An Image Presentation Order to Relieve Stress Using Facial Expression Analysis

Akiyoshi Itoda

School of Knowledge Science,
Japan Advanced Institute of Science and Technology
March 2017

Keyword: Stress-reducing, Facial expression recognition, Image processing

A recent increase in patients with lifestyle diseases has become a global problem. There are various causes for this, one of them is stress. To maintain a good health it is necessary to live without stress, unfortunately Japan has an environment where stress is easy to accumulate. As a method to reduce accumulated stress, actions such as exercise and touching nature should be performed. However, these are time consuming methods, and it is difficult for modern people who do not have much time to spare. In this research, we are proposing a system that reduces stress easily and rapidly. This system produces a stress reduction effect by using a simple personal computer as well as a web camera. All the user has to do is to look at images displayed on his/her computer screen for several minutes. As a system structure, we first record the facial expressions when presenting some images as well as the facial expression changes when natural images with a relaxing effect are presented. Secondly, by determining the order and time of displaying images matching this change, time series change in facial expression similar to relaxation are induced. Induce facial expression change when relaxing, it is possible to intentionally create a relaxed state.

In order to evaluate the system, we conducted a Kraepelin test that stresses 10 subjects, we then presented rearranged images. We recorded subjects' heartbeat during the experiment. As the heart rate variation coefficient CVRR was calculated, it became clear that 8 subjects were in a relaxed state at the time of image presentation. Also, after the Kraepelin test, images were randomly sorted. When displaying images with constant display time we calculated CVRR and compared with when intentional rearrangement were performed. As a result, it was revealed that relaxation effect was higher by intentional rearrangement in 8 subjects. In other words, even by using the same images, it is possible to intentionally induce a human relaxation state by changing the order of images and display time.

As a future subject, since there were some subjects with little to no change in expression in this experiment, it is necessary to select an image to present again. Also, in order to capture the detailed expression, Eurlian video magnification is used to improve facial expression recognition accuracy. In the current system, we only induced the relaxation state, but we would like to create a system that triggers other emotions, such as intentionally inducing an excitement state. If this is realized, it might be possible to create a CM that improves purchasing motivation, to intentionally present excitement state before sports. These effects could be utilized in various fields.