Generation of Aesthetic Emotions guided by Perceptual Features

Ana Rodrigues, Amílcar Cardoso, Penousal Machado
CISUC, University of Coimbra
Coimbra, Portugal
(anatr, amilcar, machado)@dei.uc.pt

Abstract

We present an experimental prototype that aims the study of aesthetics-related features from visual and auditory domains to express a set of 13 emotions. In the visual domain features are unfolded with a chance of occurring according to their perceptual relevance, whereas in the auditory domain there is a previous categorization of emotions. In the end this will result in a series of digital abstract faces expressing certain emotional states.

Introduction

Understanding how to evoke a certain emotion through sound (Juslin, 2013) and image (Lindborg and Friberg, 2015) is a crucial point for the development of design artefacts based on non-verbal communication. Nevertheless, this issue is still largely unexplored by design sciences.

Based on several experiments previously conducted by multiple authors, we argue that the expression and communication between these seemingly distinct domains is easier and more comprehensible through the development of a perceptually relevant aesthetical language.

The modularity provided by digital frameworks allows the creation of dynamic environments in quick and efficient ways. As such, we propose to develop this language which we then incorporate into a computational prototype to express a specific set of aesthetical emotions.

The Prototype

It is known that several visual aspects may influence the induction of emotions. For instance, brighter colors have been linked to positive emotions, whereas darker colors have been linked to negative emotions (Lindborg and Friberg, 2015). Other associations have been studied by Cavanaugh (Cavanaugh, MacInnis, and Weiss, 2016).

In our work every emotion has a corresponding visual and auditory expression. Visual features have weights (probability of occurring) according to emotion in question. The visual alphabet is then composed by high-level features (complexity, density, texture), low-level features (line, shape, size, color), and manipulations (motion, repetition, symmetry). Inspired by Chernoff faces (Chernoff, 1973) modularity and nature, we generate several digital faces with properties guided by our previously mentioned visual alphabet. On the other side, music was subject to a previous emotion categorization based on the piece character.

Conclusions and Future Work

We made use of the digital computer's capacity to transform and manipulate multidimensional data to investigate cross-modal associations in creative ways. This work aims at contributing to a better understanding of the foundations of associations between visual and auditory domains, by providing both scientific and aesthetical foundations to solve problems of cross-domains.

Although significant bibliographic research and experimentation has been done in this work, it must be subject to continuous updates in the future. We believe that the use of IEC (Interactive Evolutionary Computation) is important to evaluate the relevance of specific features regarding a specific emotion. Using this type of approach, the user will be able to redefine or reorganize the corresponding weight of each feature, allowing the system to learn with the user, interactively, how to evolve the audiovisual mappings. This can result in two benefits: the generation of mappings that suit the preferences of the user; and the analysis of the interactions that will allow the understanding of the user's perceptual motivations.

References

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