

AESTHETIC FEATURE EXTRACTION AND AN EMOTION GUESSING MACHINE

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Images evoke an emotional response in a viewer. The response may be positive or negative, active or passive. The goal of this project was to investigate the relationship between particular aesthetic features of an image and the emotional effect that image has on a viewer. The three aesthetic features chosen to be tested were: the prevalence of horizontal and vertical lines, the brightness, and the amount of bilateral symmetry. Algorithms to extract these features were developed in Java using the computer vision library OpenCV. The algorithms returned numerical outputs corresponding to the percentage of vertical edge pixels, the percentage of horizontal edge pixels, the average brightness, the variance of brightness, and the magnitude of symmetry for a given image. Next, the author's emotional responses to a collection of 300 photographic images were collected and quantified using a model that maps every emotion to a point in arousal/valence coordinate space. Using machine-learning techniques, this response data was used to train a machine to predict the emotional responses to new images based on the output from the algorithms. Cross-validation testing of this machine with a training set of 270 images and a testing set of 30 images yielded a predictive accuracy of 90%. This suggested a strong correlation between the emotional responses to the set of images and the three aesthetic features. Enlarging the training set of images may increase the accuracy of this model. Finally, the model may be extended by considering additional aesthetic features.