

# Investigating the Role of Culture on Negative Emotional Expressions in the Wild

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## Abstract

Recent reviews in affective computing stress the importance of culture on how one expresses and perceives emotions [1]. For instance, studies suggest that collectivist cultures suppress negative emotions more than individualistic cultures to maintain harmony [2]. Therefore, fully understanding these cultural differences could provide better predictive capabilities for machine learning models. Current research in affective computing is lacking insight into the underlying social signals that represent negative emotions, such as Contempt, Anger and Disgust (the so-called CAD triad of moral emotions [3]), across differing cultures. As such, the current study aimed to address the gap in current affective computing literature, which relies more on the traditional perspective of universal emotion expression and less on cultural variations in social signals of CAD. More specifically, a Support Vector Machine (SVM) was used to classify and analyze these emotions amongst 3 different cultures representing high, medium, and low individualism scores according to Hofstede [4],[5]: North American, Persian, and Filipino. Using facial action units (AUs)[6] that were extracted from a curated, in-the-wild dataset of approximately 27,000 images extracted from 225 labeled Youtube videos was used to predict CAD amongst these cultures. Descriptive analysis on the collected dataset showed noticeable differences in prominent action units in each negative emotion across each culture. In Contempt for instance, AU25, AU1, AU4 were the most intense for North American cultures, followed by Filipino and Persian cultures respectively. Using the SVM model we found that the accuracy of using North American contempt as a predictive tool to predict emotions in Persian expressions and Filipino expressions barely exceeded chance, with approximately 37% and 33% accuracy respectively. However, within-culture training and testing accuracy was found to be around 55% for Persian culture, 47% for Filipino and 66% for North American culture. These results support that negative emotions cannot be considered similar across varying cultures, and provide evidence for varying social signals associated with CAD depending on culture. Future work includes the use of clustering to identify the specific underlying social signals of negative emotions for each culture.

## References

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