ArtEmotions

**Abstract**

ArtEmotions aims to predict emotional responses to artworks by analyzing features such as art period, artist, creation year, medium, and subject focus. Building upon the WikiArt Emotions dataset, which comprises 4,105 artworks annotated for emotions evoked in observers, this project refines the data and develops a predictive model to classify viewer reactions as positive, negative, or mixed.

**Introduction**

Art has the profound ability to evoke a spectrum of emotions in its audience. Understanding these emotional responses is valuable for artists, curators, psychologists, and the broader field of human-computer interaction. The WikiArt Emotions dataset, introduced by Mohammad and Kiritchenko, provides a foundation for analyzing such responses, containing annotations of emotions elicited by over 4,000 artworks. ArtEmotions builds upon this dataset to develop a predictive model that forecasts emotional reactions based on specific artistic features.

**Methods**

*Data Collection and Cleaning*

The original WikiArt Emotions dataset includes annotations for emotions evoked by artworks, with each piece evaluated by at least ten annotators. Annotations encompass emotions triggered by the image alone, the title alone, and the combination of both, along with ratings on a scale from -3 (dislike) to 3 (like), and indicators of whether the artwork depicts a face or body. For this project, the dataset was refined by:

• Combining separate artist and title columns into a single “artist\_title” column for unique identification.

• Consolidating emotion annotations into three categories: positive, negative, and mixed/other.

• Removing columns containing "ImageOnly" and "TitleOnly" data to focus on holistic emotional responses

• Extracting face and body presence into separate binary columns (“Face”, “Body”, “None”)

*Feature Selection*

The predictive model utilizes the following features:

• **Art Period**: Categorization of the artwork’s historical context.

• **Artist**: The creator of the artwork.

• **Year**: The year the artwork was created.

• **Medium**: Distinguishing between paintings and other art forms.

• **Subject Focus**: Indicating whether the artwork focuses on a face, body, or neither.

*Model Development*

A Random Forest classifier was developed to predict the emotional response category (positive, negative, mixed) based on the selected features. The dataset was split into training (80%) and testing (20%) sets, and the model was trained to predict emotional responses (positive, negative, mixed). Performance was assessed using accuracy, precision, recall, and F1-score

**Results**

The Random Forest classifier achieved a 65.53% on the test set. The confusion matrix showed that the model performed best in identifying positive emotions, with the most misclassification occurring between negative emotions.

**Discussion/Conclusion**

ArtEmotions successfully predicts the emotional response to artworks using a machine learning approach. The model’s accuracy suggests that artistic features such as period, medium, and subject matter significantly impact emotional perception. However, certain limitations exist, such as potential biases in the dataset and the subjective nature of emotional annotations.

**Future Work**

Future enhancements to ArtEmotions could include:

• **Expanding Features**: Incorporating additional features such as color schemes, brushstroke patterns, and thematic content.

• **Larger Dataset**: Augmenting the dataset with more artworks to improve model generalization.

• **Real-Time Analysis**: Developing applications that provide real-time predictions of emotional responses to new artworks.

**References**

• Mohammad, S. M., & Kiritchenko, S. (2018). WikiArt Emotions: An Annotated Dataset of Emotions Evoked by Art. In *Proceedings of the 11th Edition of the Language Resources and Evaluation Conference (LREC-2018)*, Miyazaki, Japan. European Language Resources Association (ELRA).