

## **1) Project Background**

Our project aims to develop a music recommendation system that recommends music based on sentimental analysis of a user's KakaoTalk profile status message. One of the key motivations we had for this project was the prevalence and ubiquitous use of social media and proprietary messaging platforms. As music and social media are both ways to express one's self, providing music recommendations using simple information (in our case a status message) would be very exciting to experience. Due to the numerous studies conducted on NLP, sentiment analysis and classification, we recognized the potential for incorporating two sentiment analysis models into one to provide accurate recommendations.

## **2) Related Works**

Previous research has explored various techniques for recognizing and classifying emotions, including machine learning-based emotion analysis techniques, word embedding, and deep learning-based techniques. In the music recommendation field, personalized music recommendation systems have been developed based on understanding users' music preferences

One study developed a music recommendation system based on sentimental analysis of social media posts and found that it outperformed traditional collaborative filtering approaches. The paper presents a music recommendation system based on a sentiment intensity metric, named enhanced Sentiment Metric (eSM) that is the association of a lexicon-based sentiment metric with a correction factor based on the user's profile

([https://www.researchgate.net/publication/283238023\\_Music\\_Recommendation\\_System\\_Based\\_on\\_User's\\_Sentiments\\_Extracted\\_from\\_Social\\_Networks](https://www.researchgate.net/publication/283238023_Music_Recommendation_System_Based_on_User's_Sentiments_Extracted_from_Social_Networks))

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CLOVA Sentiment uses artificial intelligence to analyze the sentiment of a given text, such as a review, comment, or social media post, and determine whether it is positive, negative, or neutral. The tool is primarily used for social media monitoring, brand reputation management, and customer service analysis. (<https://www.ncloud.com/product/aiService/clovaSentiment>.)

## **3) Goals & Novelty**

The main goal of this project is to develop an AI system that can accurately recognize the emotions expressed in KakaoTalk status messages and recommend songs that fit those emotions. The system will suggest personalized music recommendations based on the user's emotional state, as expressed through their profile's status message. The novelty lies in the fact that most works end up with analyzing emotion of only one data. However, our tool will analyze the emotion classification of both status message and music and use this in conjunction to provide music recommendations .

## **4) Dataset**

KOSAC: based on Korean movie review data and is labeled with one emotion, positive, negative, or neutral, sentence by sentence. After learning an emotion analysis model using this dataset, you can predict emotions by applying it to Korean text extracted from the KakaoTalk

status message.

Melon Playlist Dataset: based on Korean playlist data collected by Melon and contains millions of songs and playlists to which they belong. Based on this, a personalized Korean music recommendation system can be established.

Datasets provided by the National Institute of Korean Language. They provide a labeled dataset for sentiment analysis and a general corpus dataset of ordinary everyday life conversations in Korean.

## **5) Accuracy**

Accuracy measures the ratio of sum of true positive and true negatives out of all the predictions made

Precision measures the proportion of recommended songs that are relevant to the user's emotional state, which can be used to evaluate the accuracy of the system.

F1 score combines precision and recall to provide a single measure of performance, which can be used to evaluate the overall effectiveness of the system.

Recall score is used to measure the model performance in terms of measuring the count of true positives in a correct manner out of all the actual positive values or in our case, the number of songs to emotions correctly matched.

## **6) Baseline Comparisons**

Collaborative filtering - This approach recommends songs based on the user's listening history and the preferences of other users with similar sentiment.

Content-based recommendation - This approach recommends songs based on the musical attributes and characteristics of the user's profile music, providing a baseline for comparison to measure the effectiveness of sentimental analysis-based recommendations.

Cross-validation can be performed on both the sentiment/emotion analysis model and the music recommendation system to evaluate the generalization performance of the model