

Emotion Analysis Report

Introduction

Emotion is a way of expressing thoughts, and there are many emotions and many platforms to express emotions, such as Twitter, Instagram, YouTube, etc. All these platforms provide us with a great place to express our thoughts, and considering the forum we took, YouTube has a comment section where viewers express their thoughts and feelings. All of these have some emotion behind them, and they find the emotion to conclude whether the video is positive or negative, happy or sad, violent or peaceful, etc. We would only know what the video is about by analyzing all these comments depending on the emotion interpreted. But as we know, the amount of data in these platforms is humungous, and we cannot analyze it manually, so we designed a model to explore all these comments.

Objective

This project uses advanced sentiment analysis techniques to analyze comments and accurately map them with their corresponding emotions. By implementing natural language processing algorithms and machine learning models, the aim is to derive state of emotion described in the video (highest number of comments received for a given video).

The project will preprocess the statements, tokenize them into individual words, and assign sentiment scores to each word. Then, the scores will be combined to determine each comment's overall sentiment and map it to specific emotions such as happiness, sadness, anger, and more. The ultimate goal is to comprehensively understand the comments dataset's emotional engagement and sentiment patterns.

Methodology

Multi-class classification is a machine learning task that aims to assign input data to one of several predefined classes or categories. It extends binary classification by allowing for more than two classes. The sentiment analysis we described, where emotions are considered into 6 predefined classes such as sadness, joy, love, anger, fear, and surprise, can be regarded as a multi-class classification. The sentiment labels serve as the classes, and the sentiment analysis model with Transformers is used to classify the comments into these emotion categories.

The process we followed :

1. **Downloading YouTube Comments:** Before the code, we must use YouTube Data API or a web scraping technique to fetch comments from YouTube videos. Once you have the comments, you can store them in a list or any suitable data structure.
2. **Saving Comments to CSV:** After obtaining the comments, we can use the Pandas library to create a DataFrame and keep the words in a CSV file. We can download the CSV file by specifying the path and using Pandas's `to_csv()` function.
3. **Data Preparation:** Once we download the CSV file, we use a code that reads the file using `pd.read_csv()` from Pandas and removes the unnecessary columns using the `drop()` function.
4. **Text Preprocessing:** This step includes several functions (`clean_html()`, `clean_text1()`, `clean_text2()`) to clean the comments. These functions remove HTML tags, punctuation, and special characters and perform other necessary cleaning steps to ensure consistency in the text data.
5. **Sentiment Analysis Model with Transformers:** We utilize the Transformers library, a powerful NLP library developed by Hugging Face. We load a pre-trained sentiment analysis model from Transformers using the `AutoTokenizer` and `AutoModelForSequenceClassification` classes. These classes allow you to tokenize the comments and load the pre-trained model without manual configuration.
6. **Sentiment Analysis:** The loaded sentiment analysis model then analyzes the comments' sentiment. It uses Transformers's `pipeline()` function to perform sentiment analysis on the tokenized words. The `pipeline()` function also simplifies the process by automatically handling the tokenization, model inference, and sentiment classification.
7. **Emotion Mapping:** We map the sentiment labels (numerical values) to specific emotions using a predefined emotion mapping dictionary. This mapping assigns sadness, joy, love, anger, fear, and surprise to the sentiment labels.
8. **Results and Output:** Then we create a new data frame containing the original comments, sentiment labels, sentiment scores, and mapped emotions and save the data frame to a new CSV file using the `to_csv()` function. Additionally, the code displays the results by printing the DataFrame.

Following the above methodology, we downloaded comments from YouTube URLs in the Jupyter framework, preprocessed the text, performed sentiment analysis using the Transformers library, mapped emotions, and saved the results in a CSV file within the colab framework.

Note

The above method uses a pre-trained sentiment analysis model from the Transformers library instead of training a custom model. This decision has several advantages. Firstly, pre-trained models have been trained on large amounts of data and have learned intricate patterns and representations that can benefit sentiment analysis. Not preparing a model from scratch saves significant time and computational resources. Additionally, pre-trained models have undergone extensive fine-tuning and optimization, making them more likely to provide accurate and reliable sentiment predictions. By utilizing a pre-trained model, we can leverage the expertise and efforts of the NLP community, benefiting from the latest advancements in sentiment analysis. This approach also allows for faster development and deployment, as the pre-trained model can be readily used without extensive training or customization. A pre-trained sentiment analysis model from Transformers provides a convenient and effective solution for sentiment classification tasks.

Input

	comment
0	I Like eeyore's tail
1	Freakin hell pooh
2	Poor eyeore. Getting honey shoved down his throat, then gets brutally murdered. Poor guy.
3	Poor Eeyore, he was never the same after the death of Optimus Prime
4	Wasn't this because they forgot his birthday or is this a different episode?
5	Won't they get diabetic after eating all those honey
6	I can't believe it! I have been spelling Eeyore wrong. I think he or would be very sad about that perhaps. Or he might take it philosophically. I am an Eeyore myself.
7	Eeyore, I don't know if this will make happy, but I want to let you know that I will be making more Winnie the Pooh movies and a new series when I work at Disney and bring DisneyToon Studios back in business. You will have a role in them that I'm sure everyone will enjoy seeing you in. And I'm also going to revive The Book of Pooh for Season 3 so we can see you again.
8	I miss watching Winnie the Pooh when I was younger💎
9	Eeyore you are loved by everyone♥
10	0:14 NAH!!
11	I came back to this after the newest "movie" about this certain character just to refresh myself
12	Eeyore is no more He was killed by his frnds

13	0:28 href="https://www.youtube.com/watch?v=Y-Ye46l29r4&t=0m51s">0:51
14	Post nubila, Phoebus!
15	Eeyore is pretty cute when he's gloomy
16	Anyone know this episode/movies name? I wanna watch this where they're all trying to cheer Eeyore but I don't find anything💎💎
17	Wait a second this isn't slipknot
18	0:43 Though means well, I think Pooh's trying to kill Eeyore. 💎💎
19	I'm so sorry... But if Piglet thinks that's a "wonderful time", imagine what he thinks is an un-wonderful time...
20	Honey
21	0:25 I think Eeyore was trying to tell Pooh that he doesn't like honey.
22	At least Eeyore is happy and already cheered up by 8 girls from The Simpsons. Eeyore is now in Springfield. He is now in a relationship with The Simpsons characters.
23	💎
24	That's two WtP characters who don't like honey: Tigger (because it doesn't taste like his real favorite food, fish oil) & Eeyore (poor guy looks like he's about to throw up💎).
25	0:28 still makes me laugh to this day! Watching Pooh Bear ram that smackerel of honey into Eeyore's mouth
26	I'll never forgive Disney for getting rid of Peter Cullen as Eeyore. He was the perfect voice for him.
27	I love eeyore
28	Eeyore's so sweet
29	You know Pooh means business when he gives you his hunny.
30	eeyore i hope you know we love you very much and i wish i could give you a big hug, you are very special to us <33
31	I love Eeyore. ❤️
32	Hello Eeyore. 💎
33	The older I get, the more I relate to Eeyore.
34	My bro Eeyore trying to get his depression under control and that yellow S.O.B force feeding him honey
35	Eeyore is just a stressed adult
36	Which Winnie the Pooh movie is that
37	Eeyore is my spirit animal can't change my mind
38	i remembered this
39	i really love Eeyore

40	Optimus Prime as Eeyore
41	Eeyore is the mature one
42	Eeyore: Serving leftovers? Pooh: No, I'm going to cheer you up! Eeyore: But I' already cheered up (tries and fails to smile) XD
43	Eeyore reminds me of this big yellow Lab I had as a kid. The Lab was big and dorky but he had a lot of Eeyore's personality. I miss him. He was a good boy.
44	Babe . Peter
45	Hey eeyore the donkey are you friends with gkari?
46	This sad Git. I like him
47	Hi Eeyore, Pooh told me why you were upset and I'm so sorry. Here, I got a present for you (pulls out a bouquet of roses) Happy Birthday.
48	E-Yar!
49	"Loneliness always eats up time, fills on depression where hands move slow, to reach out for a moment of care."
50	Eeyore, did you know you're loved by many?
51	??
52	Oh nooo poor piglet
53	Hello, Eeyore.

Output

comment	Emotion	Score	Mapped_Emotion
I Like eeyore's tail	2	0.797283292	love
Freakin hell pooh	2	0.251987189	love
Poor eyeore. Getting honey shoved down his throat, then gets brutally murdered. Poor guy.	0	0.639682591	sadness
Poor Eeyore, he was never the same after the death of Optimus Prime	1	0.382333606	joy
Wasn't this because they forgot his birthday or is this a different episode?	2	0.781861842	love
Won't they get diabetic after eating all those honey	2	0.647167563	love
I can't believe it! I have been spelling Eeyore wrong. I think he or would be very sad about that perhaps. Or he might take it philosophically. I am an Eeyore myself.	2	0.700542033	love
Eeyore, I don't know if this will make happy, but I want to let you know that I will be making more Winnie the Pooh movies and a new series when I work at Disney and bring DisneyToon Studios back in business. You will have a role in them that I'm sure everyone will enjoy seeing you in. And I'm also going to revive The Book of Pooh for Season 3 so we can see you again.	2	0.886665463	love

I miss watching Winnie the Pooh when I was younger💎	2	0.926929712	love
Eeyore you are loved by everyone♥	2	0.91641748	love
0:14 NAH!!	1	0.380060732	joy
I came back to this after the newest "movie" about this certain character just to refresh myself	1	0.697649896	joy
Eeyore is no more He was killed by his frnds	0	0.861122072	sadness
0:28 0:51	1	0.48428911	joy
Post nubila, Phoebus!	0	0.577551603	sadness
Eeyore is pretty cute when he's gloomy	2	0.506120563	love
Anyone know this episode/movies name? I wanna watch this where they're all trying to cheer up Eeyore but I don't find anything💎💎	2	0.624817133	love
Wait a second this isn't slipknot	2	0.375623912	love
0:43 Though he means well, I think Pooh's trying to kill Eeyore. 💎💎	2	0.66211617	love
I'm so sorry... But if Piglet thinks that's a "wonderful time", imagine what he thinks is an un-wonderful time...	1	0.662656903	joy
Honey	3	0.470337778	anger
0:25 I think Eeyore was trying to tell Pooh that he doesn't like honey.	2	0.800154686	love
At least Eeyore is happy and already cheered up by 8 girls from The Simpsons. Eeyore is now in Springfield. He is now relationship with The Simpsons characters.	2	0.841122985	love
💎	2	0.401939362	love
That's two WtP characters who don't like honey: Tigger (because it doesn't taste like his real favorite food, fish oil) & Eeyore (poor guy looks like he's about to throw up 💎).	2	0.791412175	love
<a href="https://www.youtube.com/watch?v=Y-Ye46l29r4&t=0	2	0.713495731	love

m28s">0:28 still makes me laugh to this day! Watching Pooh Bear ram that smackerel of honey into Eeyore's mouth.			
I"ll never forgive Disney for getting rid of Peter Cullen as Eeyore. He was the perfect voice for him.	2	0.649938881	love
I love eeyore	2	0.960342288	love
Eeyore's so sweet	1	0.637386858	joy
You know Pooh means business when he gives you his hunny.	2	0.835908949	love
eeyore i hope you know we love you very much and i wish i could give you a big hug, you are very special to us <33	2	0.940305352	love
I love Eeyore. ❤️	2	0.9502756	love
Hello Eeyore. 💎	2	0.645318925	love
The older I get, the more I relate to Eeyore.	2	0.880639851	love
My bro Eeyore trying to get his depression under control and that yellow S.O.B force feeding him honey	0	0.6326195	sadness
Eeyore is just a stressed adult	0	0.735402465	sadness
Which Winnie the Pooh movie is that	1	0.43295607	joy
Eeyore is my spirit animal can't change my mind	2	0.815215766	love
i remembered this	2	0.536757529	love
i really love Eeyore	2	0.950742543	love
Optimus Prime as Eeyore	1	0.443870962	joy
Eeyore is the mature one	1	0.770913839	joy
Eeyore: Serving leftovers? Pooh: No, I'm going to cheer you up! Eeyore: But I'm already cheered up (tries and fails to smile) XD	2	0.455979317	love
Eeyore reminds me of this big yellow Lab I had as a kid. The Lab was big and dorky but he had a lot of Eeyore's personality. I miss him. He was a good boy.	1	0.545839667	joy
Babe . Peter	2	0.541280746	love
Hey eeyore the donkey are you friends with gkari?	2	0.926594138	love
This sad Git. I like him	2	0.833588839	love
Hi Eeyore, Pooh told me why you were upset and I'm so sorry. Here, I got a present for you. (pulls out a bouquet of roses) Happy Birthday.	2	0.831054151	love
E-Yar!	1	0.339197069	joy
"Loneliness always eats up time, fills on depression where hands move slow, to reach out for a moment of care.";	2	0.517137587	love
Eeyore, did you know you're loved by many?	2	0.818091393	love
💎💎	2	0.401939362	love
Oh nooo poor piglet	0	0.793685496	sadness
Hello, Eeyore.	2	0.640944064	love

Pie Chart

