

**Department of Computer Science and Engineering**  
**CS19643-FOUNDATIONS OF MACHINE LEARNING**

# Sentitweet

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# Abstract

In this project, we introduce the development of a SocialSphere platform, a novel social media platform enriched with cutting-edge machine learning (ML) capabilities for sentiment analysis. SocialSphere offers users standard social networking functionalities including user registration, login, tweet searching, and posting. Moreover, an advanced ML model is seamlessly integrated into the platform's backend to categorize tweets into four distinct sentiment classes: positive, negative, irrelevant, and neutral. Users receive instantaneous feedback on the sentiment of their posts, empowering them to gauge their online impact. Additionally, the platform implements a proactive user behavior monitoring system, identifying accounts with a high frequency of negative posts for further scrutiny. Users surpassing a predefined threshold of negative posts face escalating consequences, ranging from warnings to account termination. Through this project, we strive to cultivate a supportive and constructive online community while showcasing the transformative potential of ML in enhancing user engagement and platform moderation on SocialSphere.

# Existing System

The existing system for the this project typically comprises traditional social media platforms available in the market, which offer basic functionalities such as user registration, login, post creation, and interaction with other users' posts. These platforms often lack robust sentiment analysis capabilities and proactive user behavior monitoring systems. Users on these platforms do not receive real-time feedback on the sentiment of their posts, and there is limitedoversight for identifying and managing accounts with frequent negative posts. Furthermore, content moderation on existing social media platforms tends to rely heavily on reactive approaches, where content is flagged and reviewed after it has been reported by users or detected by automated systems. This reactive moderation process can be time-consuming and may result in harmful content spreading rapidly before it is addressed. Additionally, existing platforms often lack advanced machine learning capabilities for analyzing sentiment and predicting user behavior, which limits their ability to foster a positive and supportive online community effectively.

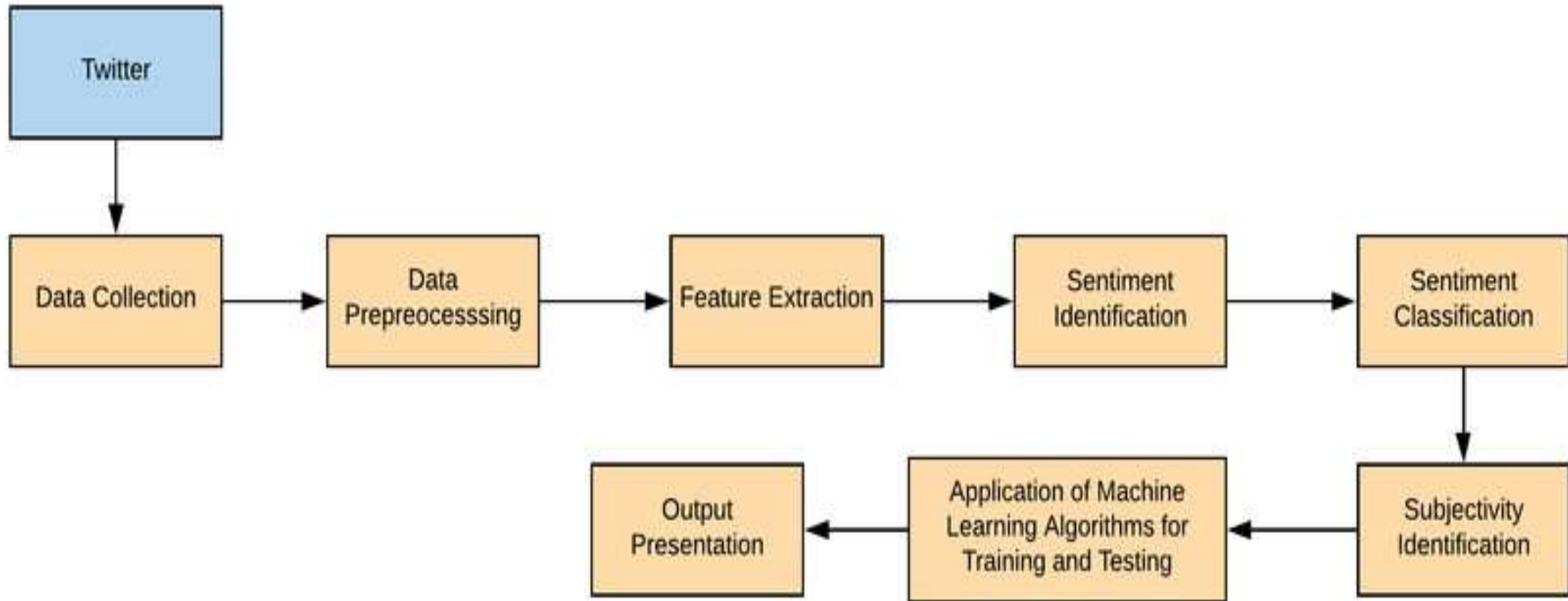
# Proposed System

The proposed system, SocialSphere, is a novel social media platform enriched with cutting-edge machine learning capabilities for sentiment analysis. It offers standard social networking functionalities such as user registration, login, tweet searching, and posting. However, the core innovation lies in the seamless integration of an advanced ML model into the platform's backend to categorize tweets into four distinct sentiment classes: positive, negative, irrelevant, and neutral. Users receive instantaneous feedback on the sentiment of their posts, empowering them to gauge their online impact in real-time.

Through the proposed system, SocialSphere endeavors to cultivate a positive online environment while showcasing the transformative potential of machine learning in enhancing user engagement and platform moderation. By providing users with real-time sentiment feedback and implementing proactive measures to address negative behavior, the proposed system aims to set a new standard for social media platforms, emphasizing user well-being and community health.

# System Architecture

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# List of Modules

- ▶ 1.USER REGISTRATION MODULE
- ▶ 2. USER LOGIN MODULE
- ▶ 3. USER SESSION MANAGEMENT MODULE
- ▶ 4. SENTIMENT ANALYSIS MODULE
- ▶ 5. PROACTIVE USER BEHAVIOUR MONITORING MODULE
- ▶ 6. TWEET DISPLAY MODULE



# Functional Description for each modules

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## **User Registration Module:**

The User Registration Module allows new users to create an account on the SocialSphere platform. It consists of the `register_page()` function, which renders a registration form for collecting user details such as email, password, and age. It validates the password confirmation to ensure that the passwords match before storing the registered user details in the session state. Upon successful registration, users receive a confirmation message, while mismatched passwords prompt an error message.

# Functional Description of Module

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## User Login Module:

The User Login Module is responsible for authenticating existing users to grant access to their accounts. It includes the `login_page()` function, which provides a login form to collect the user's email and password. The credentials are verified against the registered users stored in the session state. Successful authentication updates session state variables to reflect the user's logged-in status and displays a success message, while incorrect credentials trigger an error message.



# Functional Description of Module

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## **User Session Management Module:**

This module manages the user authentication status and session information. It initializes session state variables such as `logged_in`, `age`, `positive_tweet_count`, `tweets`, and `registered_users`. The `logout()` function is included to reset these session state variables, effectively logging the user out and clearing their session data. Upon logout, a success message is displayed to confirm that the user has been logged out.

# Functional Description of Module

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## **Sentiment Analysis Module:**

The Sentiment Analysis Module provides functionality for analyzing the sentiment of user-submitted tweets and giving feedback. It includes the `sentiment_analysis()` function, which renders a form for tweet submission, processes the tweet using a pre loaded machine learning model, and categorizes the sentiment as positive, negative, irrelevant, or neutral. Based on the analysis, the system updates the user's tweet history, increments the positive tweet count if applicable, and provides immediate feedback on whether the tweet can be posted.

# Functional Description of Module

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## **Proactive User Behaviour Monitoring Module:**

This module monitors user behavior, particularly focusing on users under 18, and manages positive tweet counts. Within the `sentiment_analysis()` function, it checks the user's age and prevents underage users from posting negative tweets by issuing a warning. It also tracks the number of positive tweets posted by each user, awarding a "Positive Badge" if the count exceeds five. This proactive monitoring helps foster a positive online environment by encouraging constructive behaviour.

# Functional Description of Module

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## **Tweet Display Module:**

The Tweet Display Module is responsible for displaying the history of tweets posted by the user, along with timestamps. It includes the `display_tweets()` function, which iterates through the user's tweet history stored in the session state and renders each tweet with its corresponding timestamp. This allows users to review their previous posts and the sentiment feedback provided, enhancing transparency and engagement on the platform.

# OUTPUTS

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## Register

Email

admin

Password

...



Confirm Password

...



Age

1




Register

Registration successful! Please log in.

# OUTPUTS

14



A screenshot of a login form on a dark background. The form includes a title, input fields for email and password, a login button, and a success message.

**Login**

Email

admin

Password

... 

Login

Login successful!



# OUTPUTS

15

×

**Profile**

Username: admin

Logout

## Twitter Sentiment Analysis

Enter your tweet

Predict

# OUTPUTS

16

×

Profile

Username: admin

Logout

## Twitter Sentiment Analysis

Enter your tweet

good

Predict

Prediction time taken: 0.03 seconds

Tweet can be posted.

### Posted Tweets

2024-05-17 20:41:03 - good

# OUTPUTS

17

×

Profile

Username: admin

Logout

## Twitter Sentiment Analysis

Enter your tweet

bad

Predict

Prediction time taken: 0.04 seconds

As you are under 18, you can only post positive tweets.

In conclusion, the SocialSphere project successfully demonstrates the integration of advanced machine learning techniques for real-time sentiment analysis and proactive user behavior monitoring on a social media platform. By accurately categorizing user posts into distinct sentiment classes and providing immediate feedback, SocialSphere enhances user awareness and promotes positive interactions. The proactive monitoring system effectively identifies and manages accounts with frequent negative posts, contributing to a healthier online environment. The project's scalability and performance highlight its potential for widespread adoption, showcasing how technology can significantly improve user engagement and community moderation. Overall, SocialSphere represents a significant step forward in leveraging machine learning to foster supportive and constructive social media experiences.

# References

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**Thank You**