

Sentiment Analysis Web Application

User Manual

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Overview

This application provides real-time sentiment analysis for customer reviews and other text content using state-of-the-art Transformer models. Built with Streamlit and powered by Deep learning, it offers:

- **Instant sentiment prediction** (Positive/Negative classification)
- **Confidence scoring** with percentage certainty
- **Feedback mechanism/Data Drift** to improve model accuracy
- **Automatic retraining** when sufficient feedback is collected
- **Version control** with Git and DVC for complete reproducibility
- **Model deployment and analytics** MLflow allows to load model and switch between versions seamlessly. It also tracks performance metrics of the model allowing insights into overall model analytics.

Tip: The model improves with your feedback! Incorrect predictions help retrain the system.

Getting Started

Option 1: Local Installation

Prerequisites:

- Python 3.8+ (python --version)
- Docker (for containerized deployment)

Installation Steps:

1. Clone the repository:

```
git clone https://github.com/ehindasche/Amazon-Review-Sentiment-Analysis
```

2. Install dependencies:

```
pip install -r requirements.txt
```

3. Launch the application:

```
streamlit run app.py
```

Access: <http://localhost:8501>

Option 2: Docker Deployment (Recommended)

```
docker-compose up --build
```

- **Streamlit UI:** <http://localhost:8501>
- **MLflow Dashboard:** <http://localhost:5000>
- **Monitoring:** Grafana (<http://localhost:3000>)

Using the Application

Step 1: Text Analysis

1. Enter text in the input box
2. Click the **Analyze** button

Step 2: Interpretation of Results

The system will display:

- **POSITIVE** (with confidence percentage)
- **NEGATIVE** (with confidence percentage)

Step 3: Feedback Submission

exclamation-triangle Found an incorrect prediction?

1. Select correct sentiment from dropdown

2. (Optional) Add explanatory comments

3. Click **Submit Feedback**

Note: After **2+ feedback submissions** (2 is a configurable parameter. I as a developer may increase this as required), the system automatically initiates model retraining.

Troubleshooting

Issue	Solution
App crashes on launch	Check logs/app_errors.log and verify dependencies
Model fails to load	Ensure MLflow server is running (http://localhost:5000)
Docker container issues	Run <code>docker system prune</code> and rebuild containers

Advanced Features

For Administrators

- **Model Retraining:** Automatic when feedback threshold reached
- **Data Tracking:** All feedback stored `/data/feedback.csv`
- **Performance Monitoring:** Grafana dashboard with real-time metrics

FAQs

- **Multilingual Support?** Currently English-only. Contact team for custom language model requests.
- **Training Frequency?** Only when 2 feedback submissions are received.
- **Data Privacy?** All user data is anonymized and stored locally by default.

Support

- **Email:** Eshan-Kulkarni-Developers.pvt.ltd
- **GitHub:** GitHub link for New Issue

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Documentation generated automatically with each deployment