Sentiment Analysis

-- From Business Requirement to Engineering Solution

Tianxu Jia, PhD

Outline

- Business requirement
- Business requirement analysis
- Technical requirement
- Relevant work from academic and industrial
- Aspect-based sentiment analysis using LLMs
- Demo

Business requirement(from Upwork)

1. we extracted 7 aspects and have marked them **manually** as being positive, negative or neutral

2. The list of reviews on that sheet are from 1 to 6449 and many of the have issues of **missing data** or inaccurately attributed sentiment score (for example review 6449 is missing info about taste, 6409 is missing details about price)

Task:

1. We need to properly assign the sentiment of each of the 7 aspects based in title and content

2. Where it's possible, improve the accuracy on sentiment analysis

From Business requirement analysis

- The input data is dirty
  - Solution 1: clean the data.
  - Solution 2: Select/design algorithms that robust to noise in the data

- There are several sub-problems in sentiment analysis:
  - Globe sentiment analysis
  - Aspect-based sentiment analysis
  - Context-based sentiment analysis

- This is a Aspect-based sentiment analysis problem and the the data to be processed is very dirty

Technical requirement

- For dealing with noise in data
  - I select the solution 2: robust algorithms
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- Aspect-based sentiment analysis

- **A robust Aspect-based sentiment analysis**

Relevant work in academic and industrial

Stand on the shoulders of others

- Robust Aspect-based sentiment analysis
  - Algorithms based on traditional ML algorithm
    - Must be complex and poor performance, don’t worth try
  - Algorithms based deep learning and transformer
    - https://github.com/yangheng95/PyABSA
    - https://arxiv.org/pdf/2208.01368.pdf
  - LLMs

After compare, test and consider scalable for the future:

- **My Selection: Aspect-based sentiment analysis using LLMs**

Aspect-based sentiment analysis using LLMs

- Prompt
- Langchain
- OpenAI

Demo

An aspect-based sentiment analysis demo system built with Gradio

THANK YOU
FOR
YOUR ATTENTION