Unstructured Aspect-Opinion Extraction and Sentiment Analysis

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Rule 1

- Sentiment word is a token with a dependency of **amod** if such dependency exists.
- The head of the sentiment word is an aspect.
- If an adverbial modifier exists for an adjective, add it to the sentiment word.
- If the negation exists for an adjective, add it to the sentiment word.
- E.g. Aspect: price, Opinion word: reasonable
  Aspect: mattress, Opinion word: pretty good
  Aspect: box, Opinion word: damaged

Rule 2

- For some token (e.g. root), an aspect is a child of the token with a relationship of **nsubj**, while a sentiment word is a child of the same token with relationship of Direct Object **dobj**.
- If the negation exists with dependency **neg**, add it to the sentiment word.
- E.g Aspect: lens, Opinion word: like

Rule 3

- For some token (e.g. root), an aspect is a child of the token with a relationship of **nsubj**, while a sentiment word is a child of the same token with relationship of Adjectival Complement **acomp**.

- If the negation exists with dependency **neg**, add it to the sentiment word.

- If modal adjective is present in the sentence, add negation to the sentiment word.

- E.g Aspect: it, Opinion word: firmer
Aspect: shipping, Opinion word: quick

Rule 4

- For some token (e.g. root), an aspect is a child of the token with a relationship of passive nominal subject **nsubjpass**, while a sentiment word is a child of the same token with relationship of adverbial Modifier **advmod**.
- If detected adverbial modifier has a child with relation adverbial modifier, add it to the sentiment word.
- If the negation exists with dependency **neg**, add it to the sentiment word.
- E.g. Opinion word: very comfy, Aspect: it
  Opinion word: timely, Aspect: product
  Opinion word: so long, Aspect: smell

Rule 5

- For some token (e.g. root), an aspect is a child of the token with a relationship of **nsubj**, while a sentiment word is the same token if it has a child of Complement of a copular verb **cop**.
- The camera is nice
  Aspect: camera, Opinion word: nice.

Rule 6

- If an interjection has a child with the relation **nsubj**, the child is treated as an aspect and the interjection is tread as a sentiment word.
- E.g Aspect: it, Opinion word: ok or bravo

Grouping Aspects

- The extracted aspects are clustered using kmeans algorithm and the most frequent extracted aspect is taken as a aspect category for that particular cluster.

- For an unseen review, sentiment scores for each category are calculated by first determining aspects, finding aspect category from a clustering model trained on the training data, and then by adding sentiment scores for the same categories.
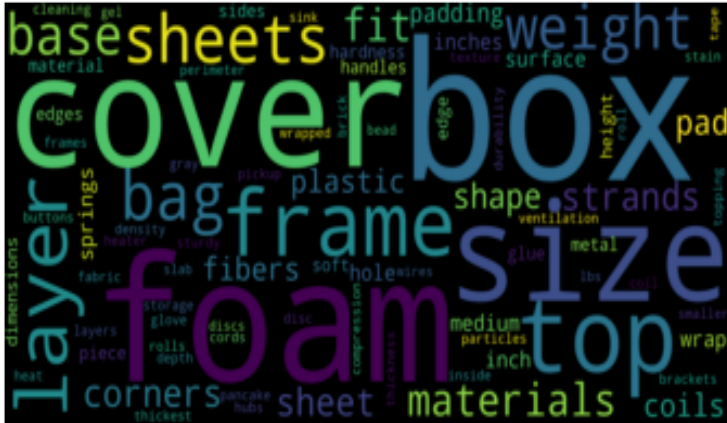
Category: Product

Category: Mattress

Category: Foam

Category: Firm

Category: Bed

Application link

Application link: http://13.233.35.211:8501/

References

- https://www.aclweb.org/anthology/W14-5905.pdf
- Aspect Extraction and Sentiment Classification of Mobile Apps using App-Store Reviews: https://arxiv.org/pdf/1712.03430.pdf
- https://achyutjoshi.github.io/aspect_extraction/assets/pdf/report.pdf