

Assessing the importance of user-defined product dimensions in reviews

Louis-Charles G  n  reux

A dark blue diagonal gradient bar that starts from the bottom left and extends towards the top right, covering the lower half of the slide.

Problem definition

What **product features** are most important to consumer experience across various **product categories**?



Gourmet food



Toys & games



Fashion



Magazine
subscriptions



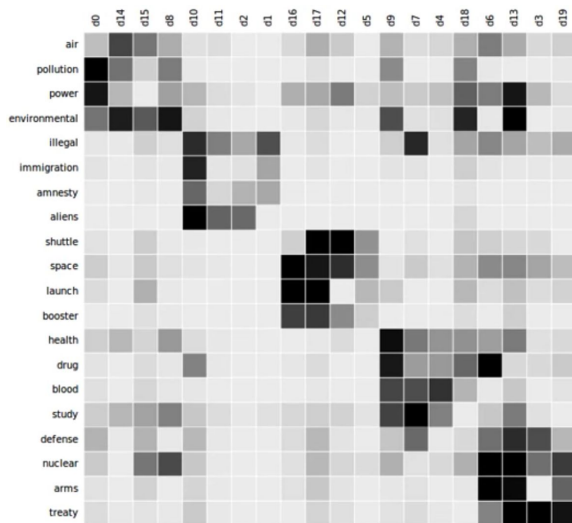
Appliances



Musical
instruments

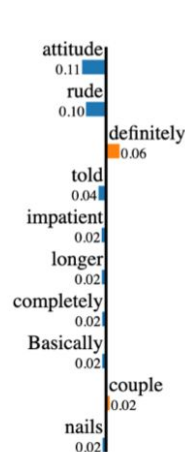
Possible approaches to solving this problem...

MACRO (full corpus)



Latent semantic analysis (LSA)

MICRO (review per review)



Text with highlighted words

I was here with my bridesmaids couple days before my wedding. The girl who did my nails had major attitude issue and was very impatient and rude doing mine. I had small rhinestones on some my nails but most of it came off after 3 days when the nail technician told it it would last at least 7 days. Then my thumb started chipping. A day later, my pointing figure which I had extension on completely came off. Basically I needed to redo my nails within a week and half. Ive been to cheaper salons and they all last WAY longer than 1.5 weeks. I will definitely not be coming back o this salon, especially not for the price they charge and the snobby attitude this nail technician has.

Prediction probabilities



Local interpretable model-agnostic explanations (LIME)

... But these methods are not ideal

MACRO (full corpus)

Assignment of documents to clusters using semantic analysis (LSA):

- **Completely unsupervised** method:
 - Classes may not capture incoming belief / hypothesis
 - Overlapping classes (some words present in different clusters)
 - Difficulty to interpret clusters
- Does not necessarily capture positive / negative sentiment

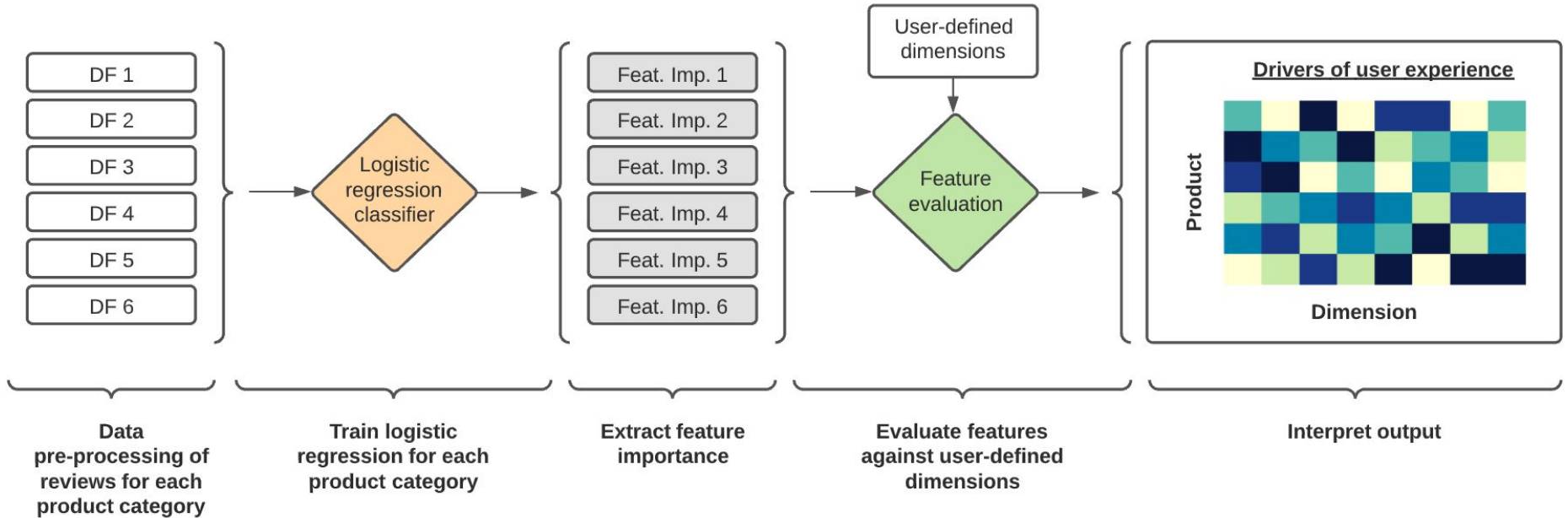
MICRO (review per review)

Localized interpretable explanations (LIME):

- Potentially **unstable** due to random sampling of words picked for reshuffling (could pick correlated words)
- **Not scalable** (interpretation of significant words is done for each document individually)

What if I could: **define my own dimensions**, and assess their importance in a **scalable fashion**?

Proposed approach to identifying drivers of user experience



This approach allows users to test a set of hypotheses (by defining their own set of dimensions)

Experience depends on...

As defined by synonyms and their neighbors

Product's **aesthetics**

[Beautiful, ugly, appearance]

Product's **sensory appeal**
(smell/touch/taste)

[Aromatic, smelly, sensory]

Product's **fit or size**

[Fit, bulky, weight]

Product's **delivery**

[Delivery, timely, delay]

Product's **ease of use**

[Intuitive, demanding, straightforward]

Product's **performance**

[Functional, defective, operational]

The 5 nearest neighbor to each dimension synonym are extracted from pre-trained GLOVE embeddings to fully define a dimension

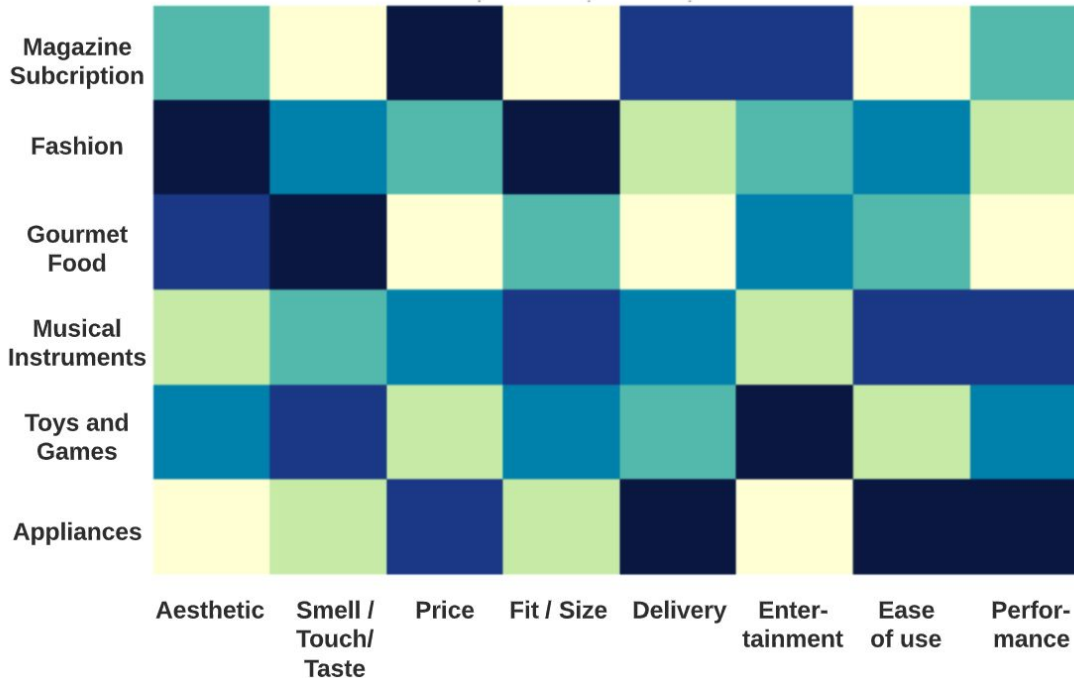
Running the algorithm allows us compare product categories easily

Relative importance

High

Low

Product
Category



Relative Importance of Customer Experience Dimension

Row-wise:

What dimensions matter for buyers of this product

Column-wise:

Which product 'spikes' most on this dimension?

Direct comparisons of products can be achieved in the web app

App user inputs

NLP INDEPENDENT PROJECT: Assessing the importance of user-defined dimensions in product reviews

This tool allows users to compare the relative importance of various user-experience dimensions across different product categories



User input
Please enter two product categories.

Type product type 1

Type product type 2

Visualize

Enter **user-defined**
product category names

Click on "**visualize**"

Output:

