Topic Modeling and Sentiment Analysis on Aesthetic Procedure Reviews

Predicting hidden topic ratings based on users sentiments

Realself Users' Reviews

29 Year Old, Wanting to Age Gracefully

jlkirsch · Worth It · $195 · N/A, Lansing, MI

Sort by: **Oldest** | Newest

*Treatment results may vary

Treatment's Review:

1 rating

I had been considering Botox for the past year. I...
22 Feb 2018 · 2 days post

I had been considering Botox for the past year. I have been worried about a couple
It was a strange sensation, though (I also tend to over think things). My ears started
ringing (which I know is a sign that I could possibly pass out). I let the Doctor know
how I was feeling, he took a break and they gave me some water. He said we were
halfway done, so I told him he could finish. Once the process was over with, they let
me relax until I felt better. I had started sweating like crazy and then I snapped back to
feeling normal. Both people in the room during my procedure were so patient and
kind. I had a great experience...minus feeling like fainting. It's only been 3 days, so no
noticeable changes yet.

♡ 1 LIKE

Add a comment...

Read 1 comment ▾

Shaun Patel, MD
Miami Physician

25 Jan 2018

If natural is what you're looking for, Dr. Patel is your Dr. If you're a person who likes professionals,
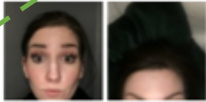Miami Skin and Vein is the place to go.

★★★★★ Overall rating
★★★★★ Doctor's bedside manner
★★★★★ Answered my questions
★★★★★ After care follow-up
★★★★★ Time spent with me
★★★★★ Phone or email responsiveness
★★★★★ Staff professionalism & courtesy
★★★★★ Payment process
★★★★★ Wait times

Doctor's Review:

9 different ratings

1 Week Later
26 Feb 2018 · 6 days post

I can definitely see a change in my forehead now that it's been a week. Still not too
much of a change between the brows. Really happy about the whole experience,
though.

♡ LIKE

Business Scenario

- **Topic Modeling:**
  - What topics do users talk about on reviews?
  - What people take into consideration when choosing a treatment?

- **Developing functionality for users:**
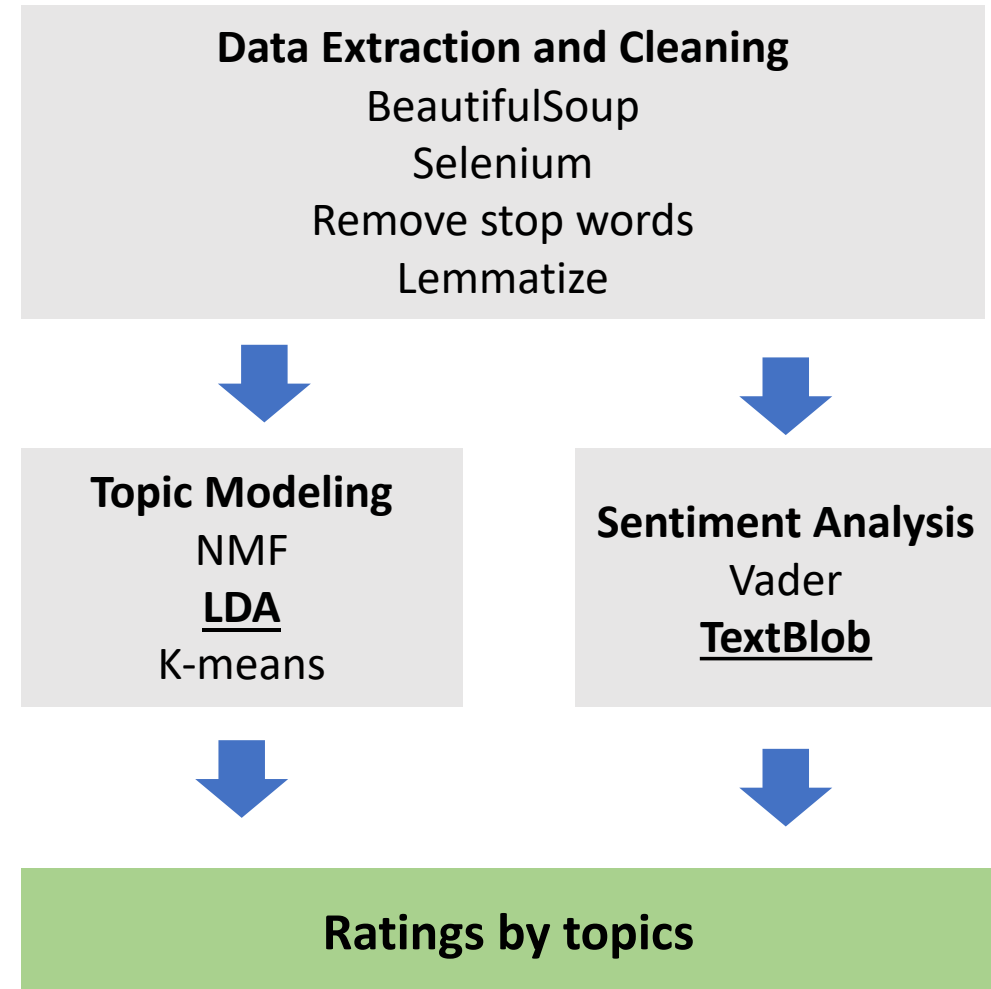 - Display rating for topics

Data + Methods

53,547
posts

17,270
unique users

3 Treatments

Data Extraction and Cleaning
BeautifulSoup
Selenium
Remove stop words
Lemmatize

Topic Modeling
NMF
LDA
K-means

Sentiment Analysis
Vader
TextBlob

Ratings by topics

Latent Dirichlet Allocation to identify topics from text

Coolsculpting

1. Surgery/pos op
2. Discomfort (swelling/numb/pain)
3. Updates/photos
4. Overall Reviews
5. Reflecting Decision

Rhinoplasty

1. Dr/Staff
2. Surgery/pos op
3. Discomfort (swelling/numb/pain)
4. Cast Removal/expectations
5. Updates/photos
6. Overall Reviews
7. Reflecting decision/ results

Botox

1. Dr/Staff
2. Injection/Motivation/ other
3. Side-effects
4. Results

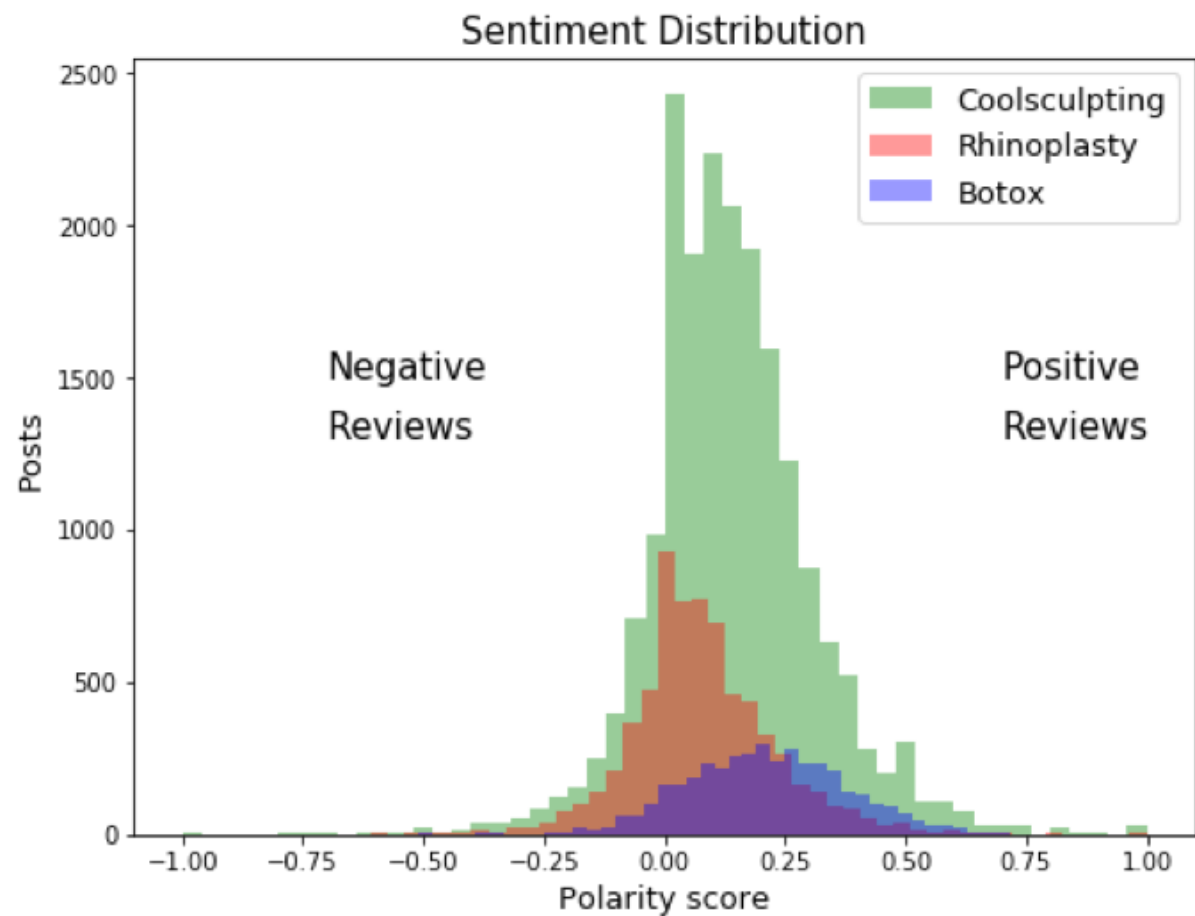# Latent Dirichlet Allocation to identify topics from text

Coolsculpting	**Rhinoplasty**	**Botox**
	1. Dr/Staff	1. Dr/Staff

Procedure

Coolsculpting	**Rhinoplasty**	**Botox**
1. Surgery/pos op	2. Surgery/pos op	2. Injection/Motivation/ other

Recovery

Coolsculpting	**Rhinoplasty**	**Botox**
2. Discomfort (swelling/numb/pain)	3. Discomfort (swelling/numb/pain)	3. Side-effects
3. Updates/photos	4. Cast Removal/expectations	
	5. Updates/photos	

Results

Coolsculpting	**Rhinoplasty**	**Botox**
4. Overall Reviews	6. Overall Reviews	4. Results
5. Reflecting Decision	7. Reflecting decision/ results	

Sentiment Analysis to find topics' ratings

Sentiment Distribution

Rating = % positive reviews on aggregated topic

⭐⭐⭐⭐ More than 75% users reviewed positively

⭐⭐⭐ 50% ~ 75% users reviewed positively

⭐⭐ 25% ~ 50% users reviewed positively

⭐ Less than 25% users reviewed positively

Dashboard demo

Insights

- **Downtime/Results trade-off:**

  - Some people prefer short recovery time while other prefer drastic results

  - Negative reviews on less-invasive procedure are usually for the minimal result.

- **High amount of "Not Sure" Reviews**

  - Many patients wait months to decide if they like the results or not.

Future Works

- **Classification model (SVM) for assigning topics to new reviews.**

- **Extract Reviews' Highlights**

  - Based on:

    - Term frequency

    - Social engagement (likes, comments, etc)

    - Sentiment

- **Comparison tool**

  - Comparison between similar treatments (e.g. liposuction vs. Coolsculpting)

Thank you!