Nudging Consumers Into Writing Better Reviews Online

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Roadmap

1. Motivation & Question
2. Models & Algorithm
3. Empirical Results
4. Takeaway & Demo

Roadmap

1. **Motivation & Question**
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As a loyal Amazon consumer...

Delivered Mar 22, 2020

Package was left inside the residence's mailbox

Trustworthy Online Controlled Experiments: A Practical Guide to A/B Testing

Kohavi, Ron

Sold by: Amazon.com Services LLC

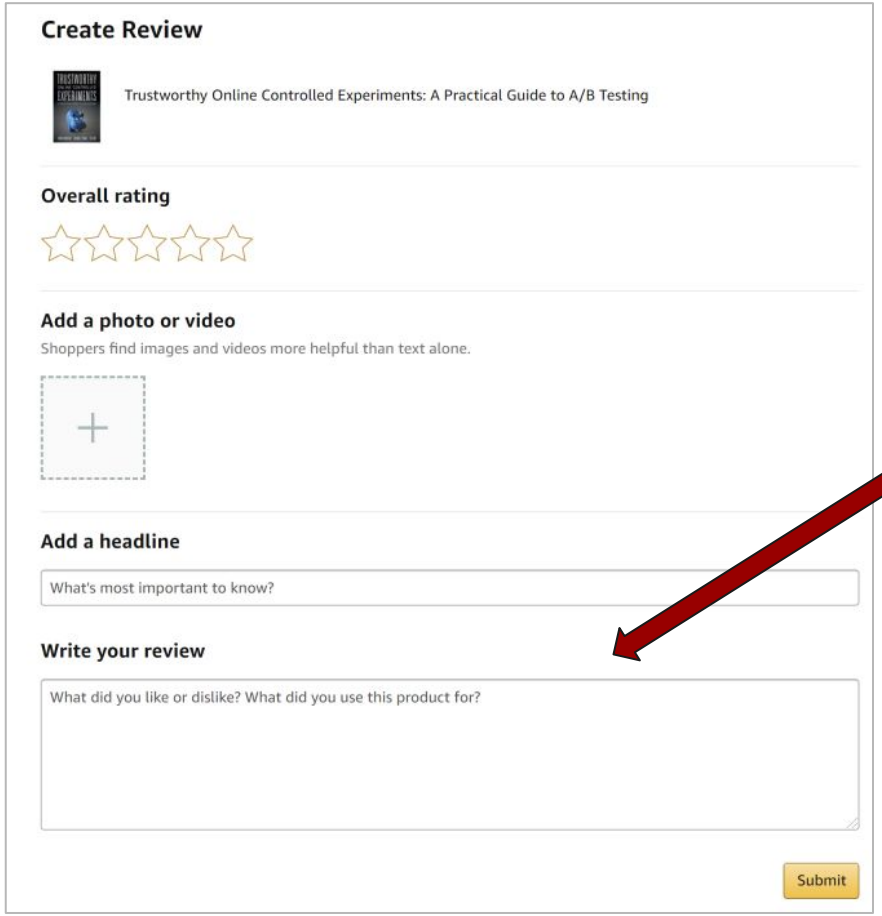
Return eligible through May 31, 2020

Buy it again | View your item

Return or replace items

Share gift receipt

Write a product review



...I tried to write a review

- How can I be more useful for others?
- What topics should I write?
- How long should I write?
- Should I write in simple terms?
- Should I include a image?
- ……

What Makes Consumer Reviews Helpful?

Roadmap

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Extract features for modeling Helpfulness

Customer images

See all customer images

Top Reviews

H. Wolf

Probably better for home use...

Reviewed in the United States on February 24, 2017

Color: Black | **Verified Purchase**

I work at a software company, and spend 9-10 hours per day pounding away on this thing.

Pros:
1. I'm able to type extremely quickly on this, and it's very comfortable.
2. No wrist fatigue
3. Little to no readjustment period from traditional keyboard angles to the more ergonomic style here

Cons:

1. Key strikes are very loud. They can hear me typing two offices away.
2. The letters have completely rubbed off of all letters aside from Q, W, Z and X. Good thing I'm not a "hunt and peck" typist
3. F lock is intermittent - you only realize it's off when you try to use it and get some other function popping up instead

189 people found this helpful

Helpful | Comment | Report abuse

Extract features for modeling Helpfulness

Customer images

See all customer images

Using real name or not

H. Wolf

Star ratings

Length and sentiment of summary

Probably better for home use...

Reviewed in the United States on Febr

Color: Black | **Verified Purchase**

Verified purchase or not

I work at a software company, and spend 9-10 hours per day pounding away on this thing.

Latent topics from topic modeling

Count of digits

Pros:
1. I'm able to type extremely quickly on this, and it's very comfortable.
2. No wrist fatigue
3. Little to no readjustment period from traditional keyboard angles to the more ergonomic style here

Sentiment

Cons:

1. Key strikes are very loud. They can hear me typing two offices away.
2. The letters have completely rubbed off of all letters aside from Q, W, Z and X. Good thing I'm not a "hunt and peck" typist
3. F lock is intermittent - you only realize it's off when you try to use it and get some other function popping up instead

Readability (Flesch score)

Length (number of unique words)

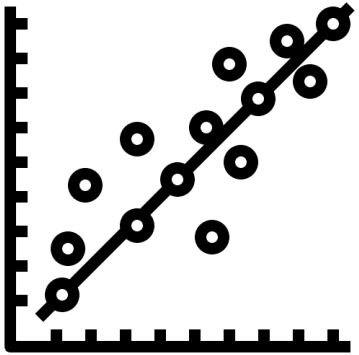
189 people found this helpful

Outcome Variable: adjusted number of “Helpful” votes

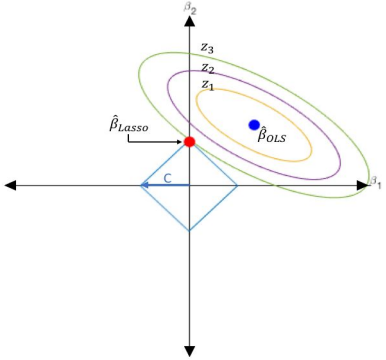
Helpful | Comment | Report abuse

Number of attached images

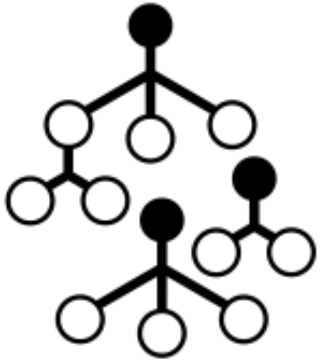
Possible Ways of Selecting Features



Linear Regression



Lasso Regression



Random Forest

Different Selected Features?

	Linear	Lasso	Random Forest
X1	✓		✓
X2		✓	
X3	✓	✓	✓
...	...	...	...

Ensemble Feature Importance

	Linear	Lasso	Random Forest	Aggregated Results
X1	✓		✓	2
X2		✓		1
X3	✓	✓	✓	3
...	...	...	...	...

Ranking Features By Importances

	Linear	Lasso	Random Forest	Aggregated Results
X3	✓	✓	✓	3
X1	✓		✓	2
X2		✓		1
...	...	...	...	...

Different Features By Ratings

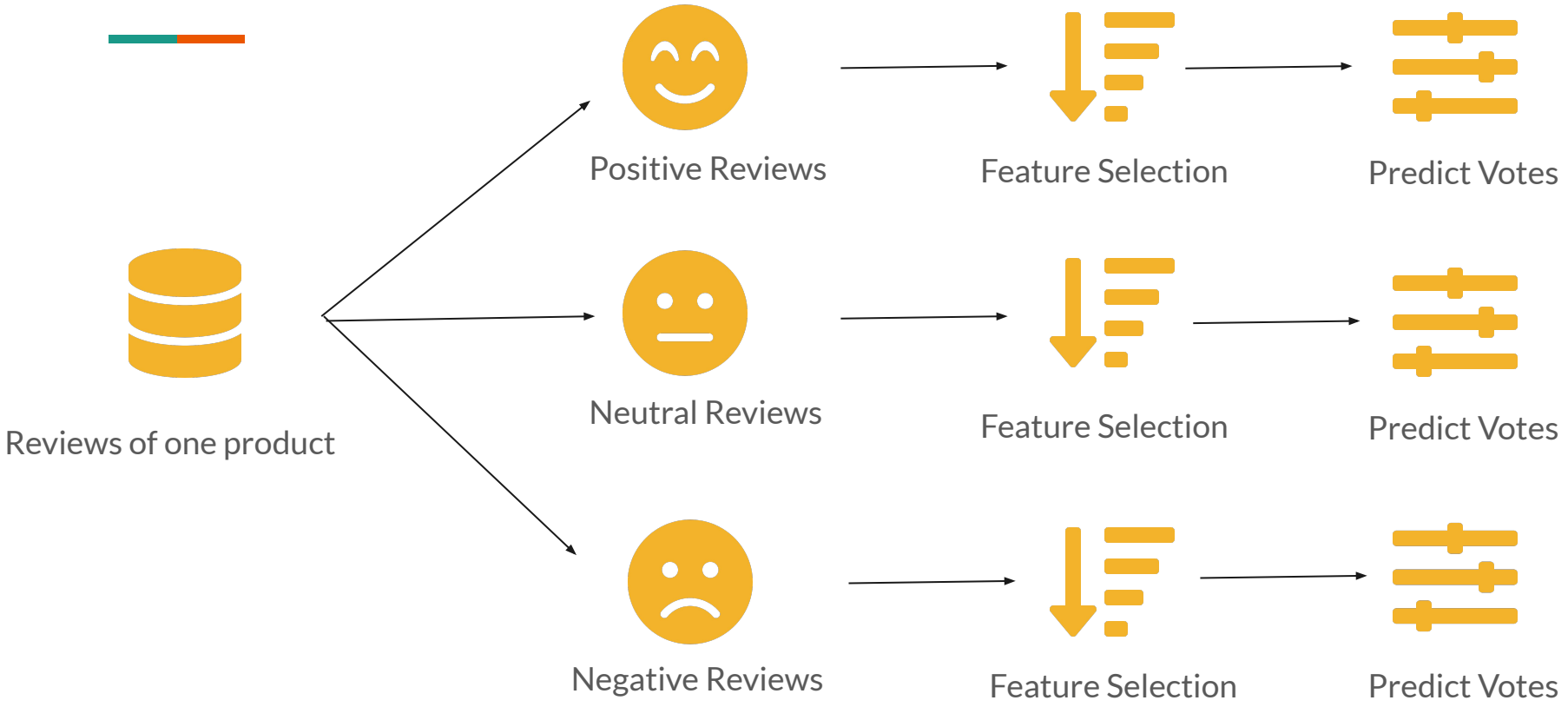
Rating-dependent Feature Selection

	Linear	Lasso	Random Forest	Aggregated Results
X1	✓		✓	2
X2		✓		1
X3	✓	✓	✓	3
...	...	...	...	...

	Linear	Lasso	Random Forest	Aggregated Results
X1	✓		✓	2
X2		✓		1
X3	✓	✓	✓	3
...	...	...	...	...

	Linear	Lasso	Random Forest	Aggregated Results
X1	✓		✓	2
X2		✓		1
X3	✓	✓	✓	3
...	...	...	...	...

Nudging Algorithm for Review Writers



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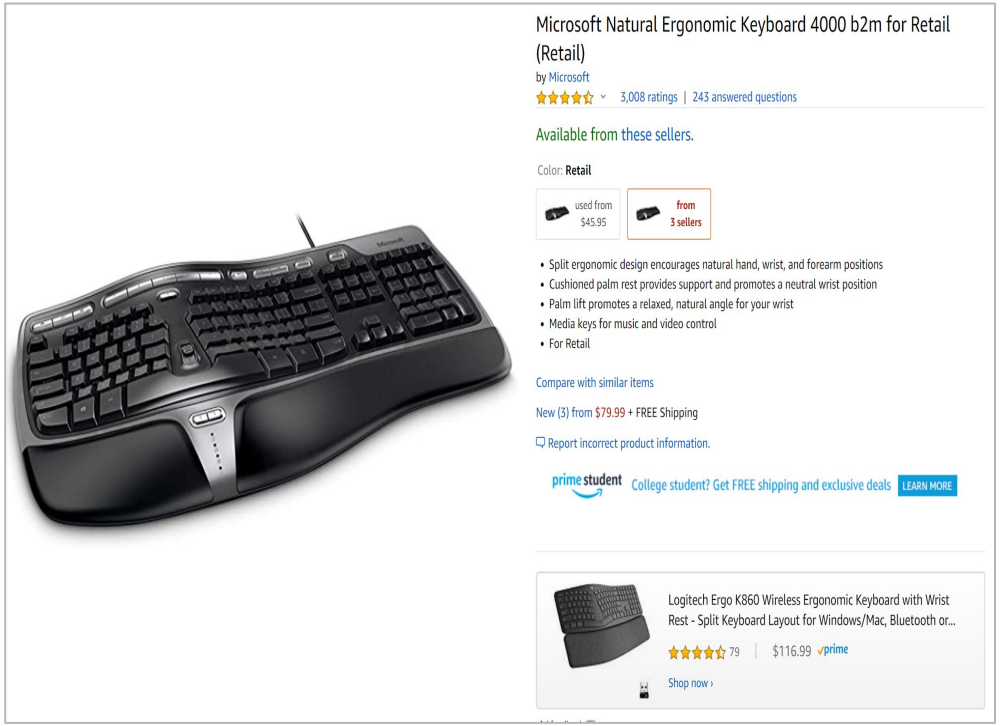
Data: Amazon Review Data (2018)

“All you can see on the Amazon product page!”

1. Scraped from the Amazon website in Nov 2018
2. Available at https://nijianmo.github.io/amazon/index.html
3. Three parts:

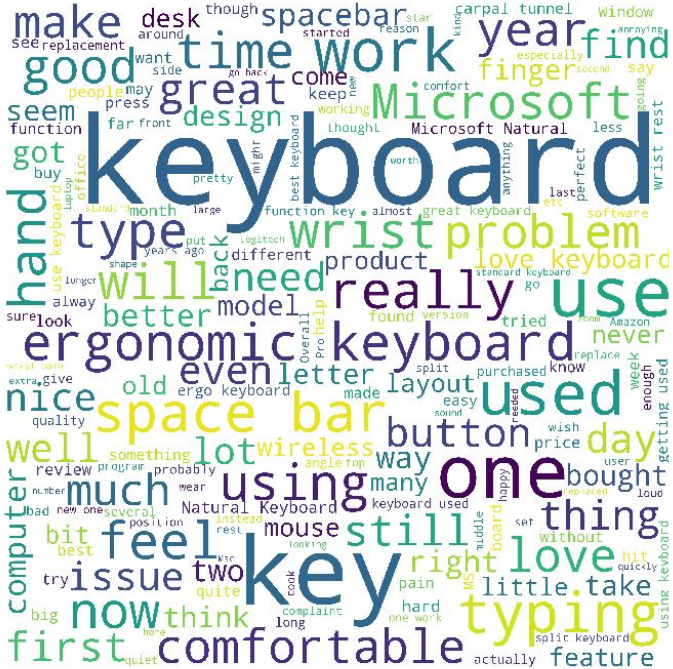
- **reviews (ratings, text, helpfulness votes)**
- product metadata (descriptions, price, brand, and image features)
- links (also viewed/also bought graphs)

Sample Data



- Microsoft Natural Ergonomic Keyboard 4000
- high average rating (4.3 / 5.0)
- Relative material product
- Stable quality

Diverse opinions within reviews



- 2567 reviews
- Written from October 2005 to May 2015
- Different substantive topics

Rating-dependent Feature Selection

Simple Nudges

Positive -> Write simply and talk about compatibility

Negative -> Include some images and talk with unique experience

Neutral -> Write a concise and clear summary

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Takeaway

- Ensemble Feature Importance

Combine results of linear regression, lasso, and random forest

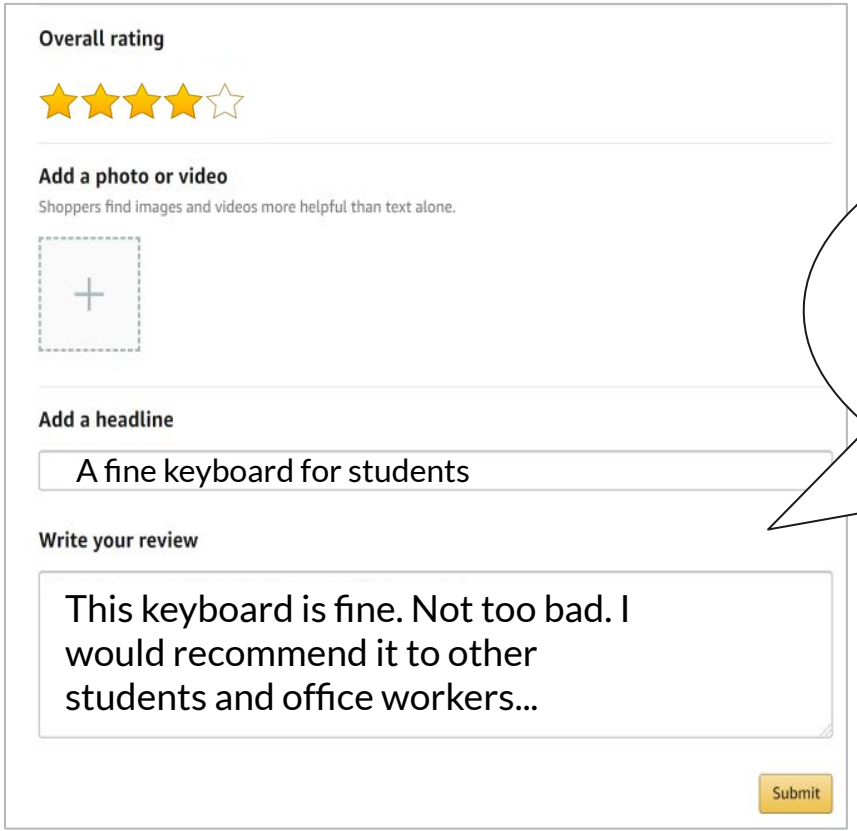
- Model Based on Consumer Behaviors

Consider how consumers might value different features conditional on ratings

- Nudging Algorithm for Review Writers

Use important features of reviews as “nudges” and predict the expected votes

Demo: how nudging could work



Predicted Helpfulness: Medium

Some personalized tips for you:

1. Why would you recommend it for students? Mentioning that in the headline
2. Is the keyboard compatible with your mouse and PC?