

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

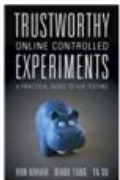


- 1. Motivation & Question**
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As a loyal Amazon consumer...

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

Create Review



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

Overall rating



Add a photo or video

Shoppers find images and videos more helpful than text alone.



Add a headline

What's most important to know?

Write your review

What did you like or dislike? What did you use this product for?

Submit

...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

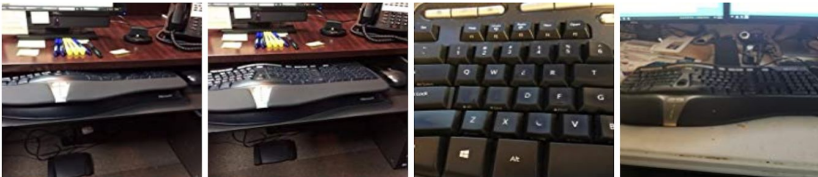
Helpful

| [Comment](#)

| [Report abuse](#)

Extract features for modeling Helpfulness

Customer images



[See all customer images](#)

Number of attached 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 February 1, 2017

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.
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Cons:

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Sentiment

Readability (Flesch score)

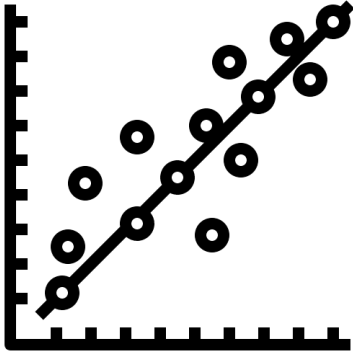
Length (number of unique words)

189 people found this helpful

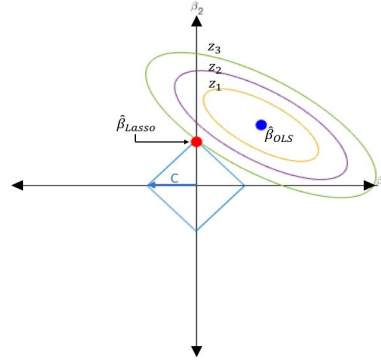
Outcome Variable: adjusted number of "Helpful" votes

Helpful | Comment | Report abuse

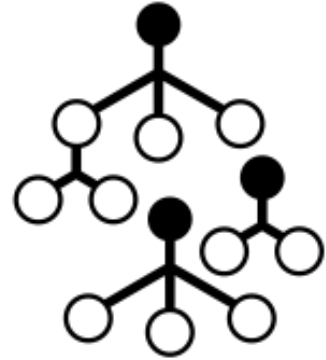
Possible Ways of Selecting Features



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

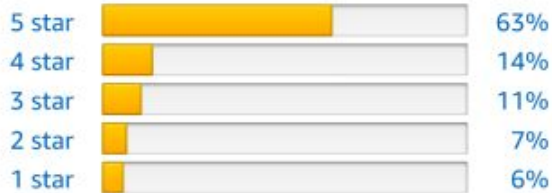
	Linear	Lasso	Random Forest	Aggregated Results
X3	✓	✓	✓	3
X1	✓		✓	2
X2		✓		1
...

Different Features By Ratings

Customer reviews

★★★★☆ 4.2 out of 5

206 customer ratings



^ How does Amazon calculate star ratings?

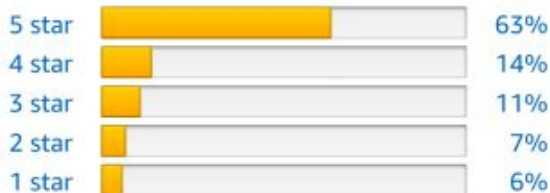
Amazon calculates a product's star ratings based on a machine learned model instead of a raw data average. The model takes into account factors including the age of a rating, whether the ratings are from verified purchasers, and factors that establish reviewer trustworthiness.

Rating-dependent Feature Selection

Customer reviews

★★★★☆ 4.2 out of 5

206 customer ratings



How does Amazon calculate star ratings?

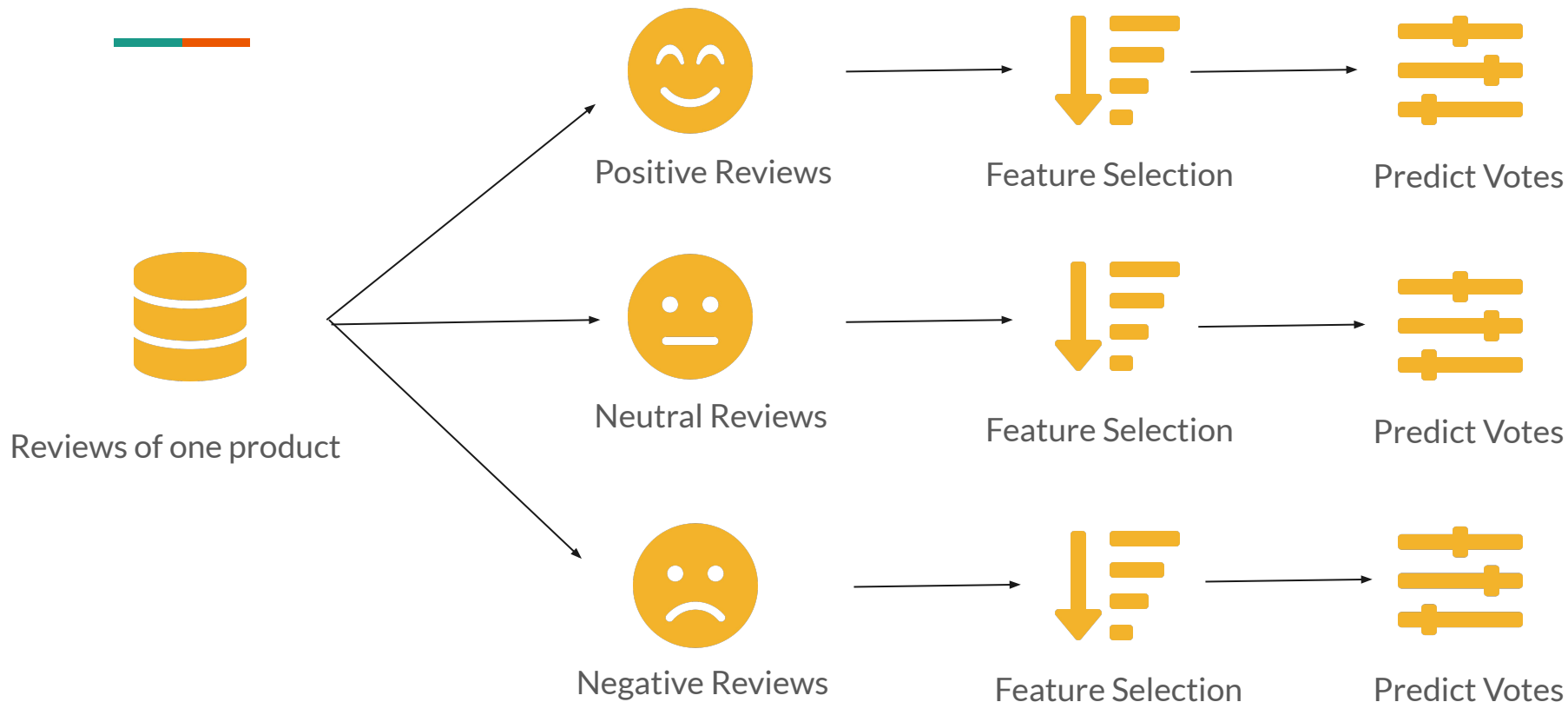
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	Linear	Lasso	Random Forest	Aggregated Results
X1	✓		✓	2
X2		✓		1
X3	✓	✓	✓	3
...

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

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 b2m for Retail (Retail)
by Microsoft
★★★★☆ 3,008 ratings | 243 answered questions

Available from these sellers.

Color: Retail

used from \$45.95 from 3 sellers

- Split ergonomic design encourages natural hand, wrist, and forearm positions
- Cushioned palm rest provides support and promotes a neutral wrist position
- Palm lift promotes a relaxed, natural angle for your wrist
- Media keys for music and video control
- For Retail

Compare with similar items

New (3) from \$79.99 + FREE Shipping

☐ Report incorrect product information.

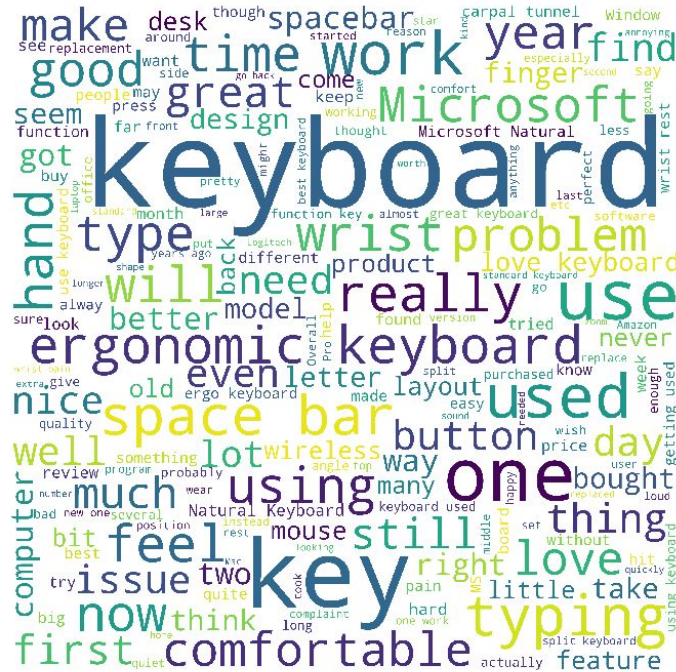
prime student College student? Get FREE shipping and exclusive deals [LEARN MORE](#)

Logitech Ergo K860 Wireless Ergonomic Keyboard with Wrist Rest - Split Keyboard Layout for Windows/Mac, Bluetooth or...

★★★★☆ 79 | \$116.99 [prime](#)

[Shop now >](#)

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



- 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

Overall rating

★★★★☆

Add a photo or video

Shoppers find images and videos more helpful than text alone.



Add a headline

A fine keyboard for students

Write your review

This keyboard is fine. Not too bad. I would recommend it to other students and office workers...

Submit



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?