

Recommendation Algorithms & Curated Social Media Feeds

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Overview of the Issue

Tech companies track user behavior to customize experience and create curated newsfeeds.

While short-term goals of boosting user engagement are met, what are the long-term effects of this technology?



How the Instagram Algorithm Decides What Content to Show People

Relationship

Does the user interact with you frequently?



Frequency of Use

How often does the user check Instagram?



Interest

Does the user typically engage with this type of post (i.e., image, video, carousel, etc.?)



Following

How many people does the user follow?



Timeliness

Was it posted recently?



Session Time

How long does the user spend on Instagram per day?



Code Segment (Node.js/CoffeeScript)

'Engine' class constructed with consideration to user likes, dislikes, activity of similar users, and suggestions.

```
class Engine
  constructor: ->
    @likes = new Rater @, 'likes'
    @dislikes = new Rater @, 'dislikes'
    @similar = new Similar @
    @suggestions = new Suggestions @
```

<https://github.com/hjr265/toptal-recommengine>

<https://www.toptal.com/algorithms/predicting-likes-inside-a-simple-recommendation-engine>

Code Segment (Node.js/CoffeeScript)

However, the most important method of this class is “Similar#update()” which works by taking a user and computing a list of other users who are similar, and storing the list in the database, along with their similarity indices. It starts by finding the user’s likes and dislikes:

```
async.auto
  userLikes: (done) =>
    @engine.likes.itemsByUser user, done
  userDislikes: (done) =>
    @engine.dislikes.itemsByUser user, done
, (err, {userLikes, userDislikes}) =>
  items = _.flatten([userLikes, userDislikes])
```

We also find all the users who have rated these items:

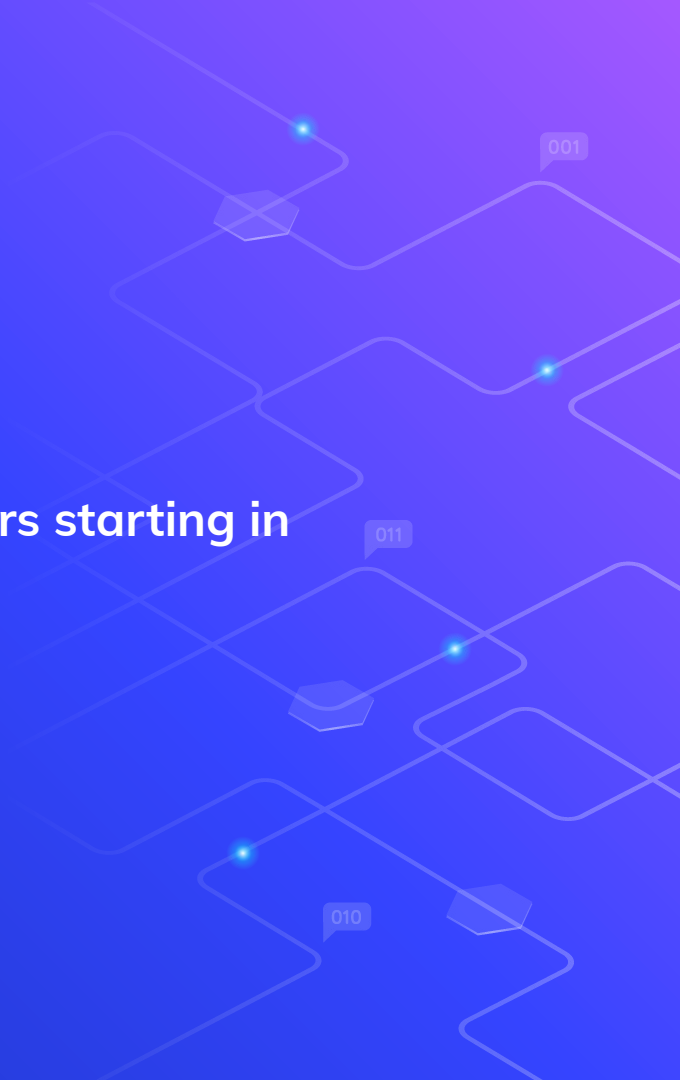
```
async.map items, (item, done) =>
  async.map [
    @engine.likes
    @engine.dislikes
  ], (rater, done) =>
    rater.usersByItem item, done
  , done
, (err, others) =>
```

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Why Should We Care?

- ⬡ Dangers of screen time addiction
 - Long-term health effects in children
- ⬡ Increase in depression & anxiety in teenagers starting in 2011-2013
 - 62% increase in girls age 15-19
 - 189% increase in girls age 10-14
- ⬡ Filter bubble → echo chamber
 - Deepens societal polarization



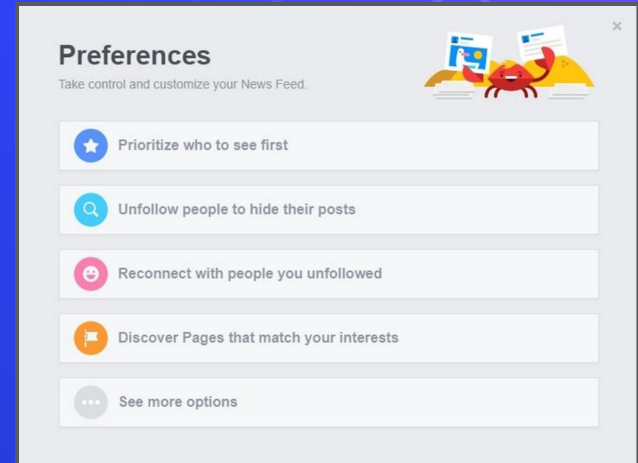
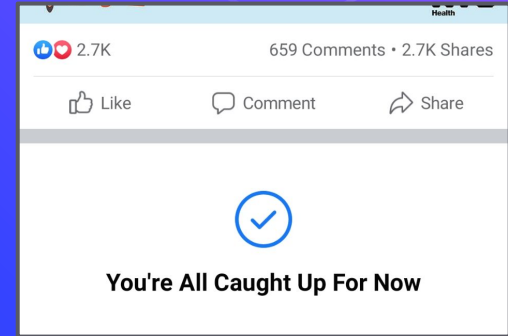


“If you’re not paying for the product, you are the product.”

- “Attention Economy” - Companies pay to influence our behavior and actions
- Social media is designed to be addictive, e.g. infinite scroll

Possible Solutions

- ⬡ Limiting use of social media
- ⬡ Fact-checking sources & information
- ⬡ Ability to turn off infinite feed
- ⬡ Different newsfeeds - by time, by preference, by person, by mutual connections
- ⬡ Browsing your own social media in “incognito mode” or “do not track” mode



Possible Lesson Ideas

- ⬡ Students will track their social media usage, content, and engagement over a week. Ask students to find patterns that may explain the activity they see.
- ⬡ Students will write a pitch or letter to a local politician on policy recommendations related to social media.
- ⬡ Students will re-design an aspect of a social media app through an ethical lens.

Additional Resources

- <https://github.com/hjr265/toptal-recommengine>
- "The Social Dilemma" (Orlowski, 2020) - Netflix documentary
- <https://www.toptal.com/algorithms/predicting-likes-inside-a-simple-recommendation-engine>
- <https://blog.hootsuite.com/instagram-algorithm/>
- <https://cacm.acm.org/news/220174-instagram-posts-can-reveal-depression-better-than-anything-patients-tell-their-doctors/fulltext>
- <https://cacm.acm.org/news/206236-how-an-algorithm-learned-to-identify-depressed-individuals-by-studying-their-instagram-photos/fulltext>
- <https://cacm.acm.org/news/199880-banning-words-on-instagram-doesnt-help-it-makes-it-worse/fulltext>
- <https://cacm.acm.org/news/227175-how-social-networking-sites-may-discriminate-against-women/fulltext>
- <https://www.china-briefing.com/news/recommendation-algorithm-regulations-china-cybersecurity-regime/>

