
Worth its Weight in Likes: Towards Detecting Fake Likes on Instagram

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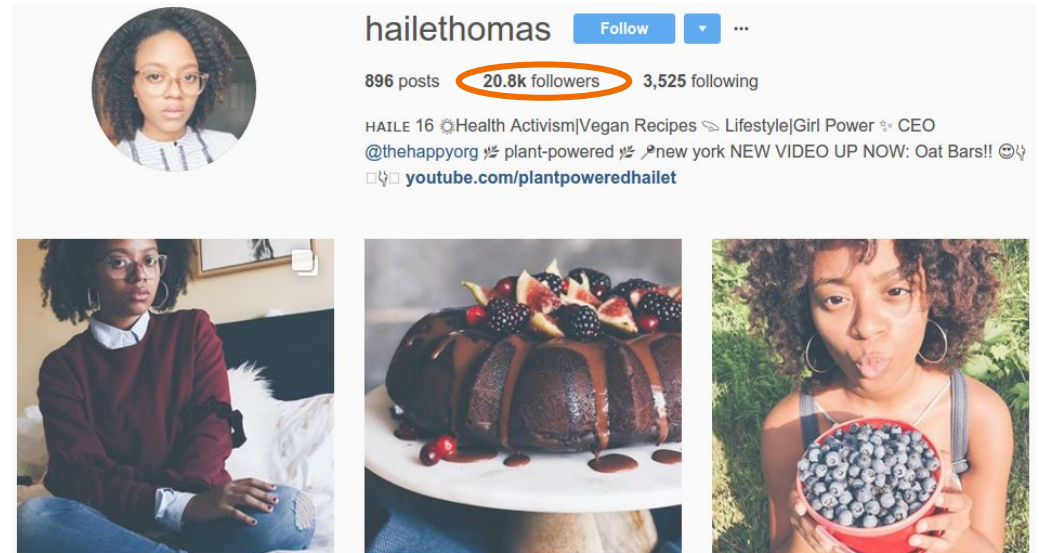
Likes, Retweets, Comments!

- Social Currency
- Self Gratification
- Evidence of Success



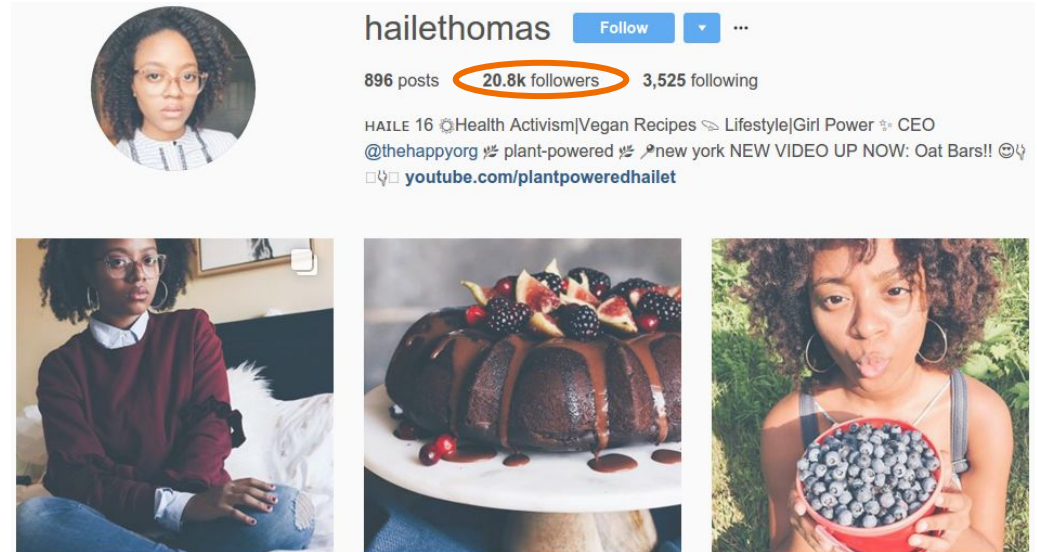
Instagram and Likes

- Visual Platform: images and videos
- Tastemakers: Food, fashion, lifestyle
- Influencer marketing
 - 1B \$ industry by 2019



Instagram and Likes

- Visual Platform: images and videos



Instagram and Likes



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71 posts **610 followers** 7,398 following

Saquib J+J 21 umeeshchandra college 4vocalist nd n
designer and manufacturer of machine and computerise




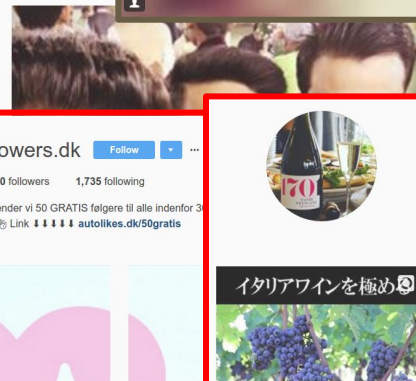
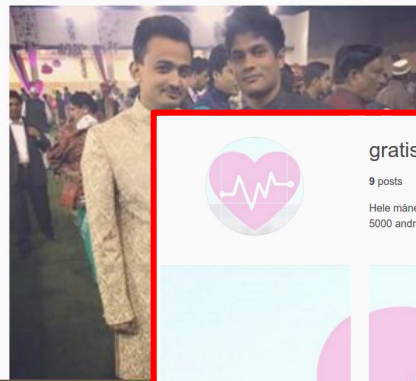
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Shenai Garden

md.saquib2012 Bhai have a look at this @ fresh look at the wedding 📸
View all 26 comments

alphatronutrition @
benhorphotography This is great :)
s.v_profi Класенько!
bridiemcphie Love this! @
davincibridal ♥
filterthensnap ♥♥
noteworthycollective This is nice :)
sasha_tv Класенько!
healthy_lifestyle_cool Keep diggin it
yashsutaria Fab!
seansalazarphotography 44 great pic!
twoalicecom @ Ekstra

1,008 likes


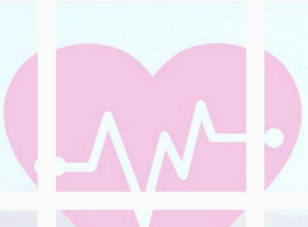
1,008 likes



gratisfollowers.dk [Follow](#)

9 posts 1,810 followers 1,735 following


Hele måneden sender vi 50 GRATIS følgere til alle indenfor 3
5000 andre! ♥📸📸 Link ! ! ! ! ! autolikes.dk/50gratis



vinohayashi [Follow](#)

138 posts 2,333 followers 3,447 following

イタリアNo.1ソムリエが日本人だってご存知ですか? 国イタリアで2度の年間最優秀ソムリエ賞に輝いた日本人ソムリエ林基就(はやしもとつぐ)のワイン通販Vino Hayashiです。【ポイント10倍セール】開催中!! [store.vinohayashi.jp](#)



Why Fake Likes?

- Influencers compensated based on likes and comments
- Incentive to artificially inflate metrics

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InstaFraud: How fake Instagram 'influencers' are gaming brands for money

- Study by an influencer marketing agency
- Fool potential brand or advertisers - stock photos

Core Research Question

- How do we ***automatically detect fraudulent likes*** on Instagram?
- Input: Like instances (LI) and their properties
- Output: Score of each LI based on its genuineness

Data Collection: How to Identify Fake Likes

One indicator: Videos without views but with likes

- 16,448 likes
- 9,932 posts
- 9,301 likers
- 7,822 posters



4 likes

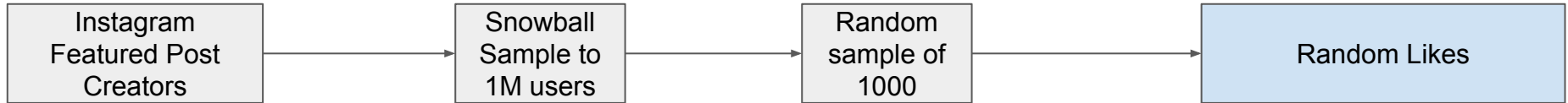
g.painphotos Apple Fritters-
What You Think... Pass or EAT??

I Like Them Sometimes.. Work Life .. Time To Make... more

4 MINUTES AGO



Data Collection: Random Likes



	#Likes	#Posts	#Likers	#Posters
Fake	16,448	9,932	9,301	7,822
Random	134,669	1,717	47,233	738

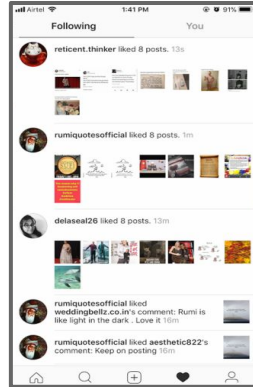
Possible Reasons for Genuine Liking

- Hypotheses based on understanding of liking

Likes due to Network
Effects



Homepage:
followers'
posts



Likes of
followers

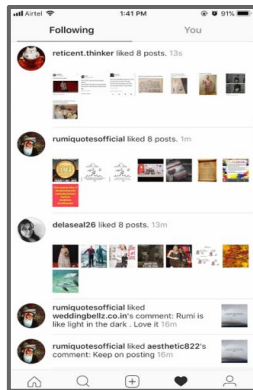
Possible Reasons for Genuine Liking

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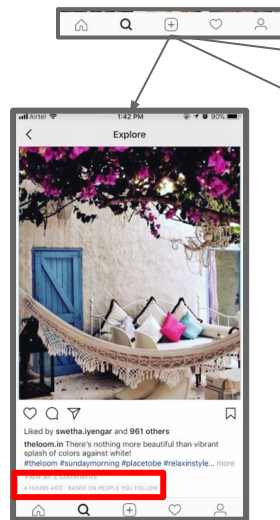
Likes due to Network Effects



Homepage:
followers'
posts



Likes of
followers



Based on
people you
follow



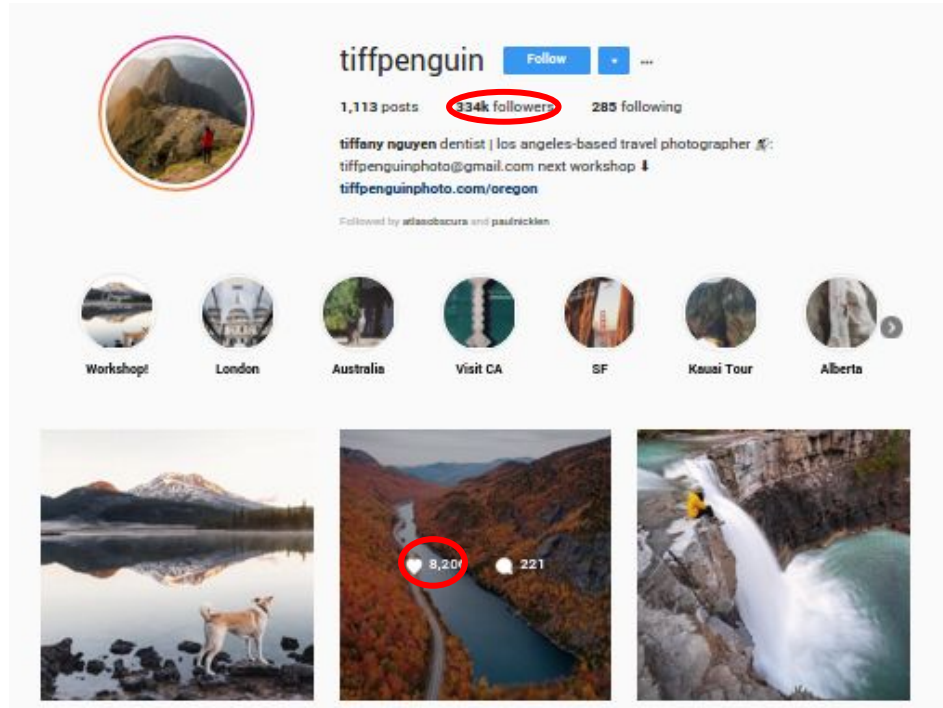
Based on
photos you
liked

Likes due to Interest
Overlap

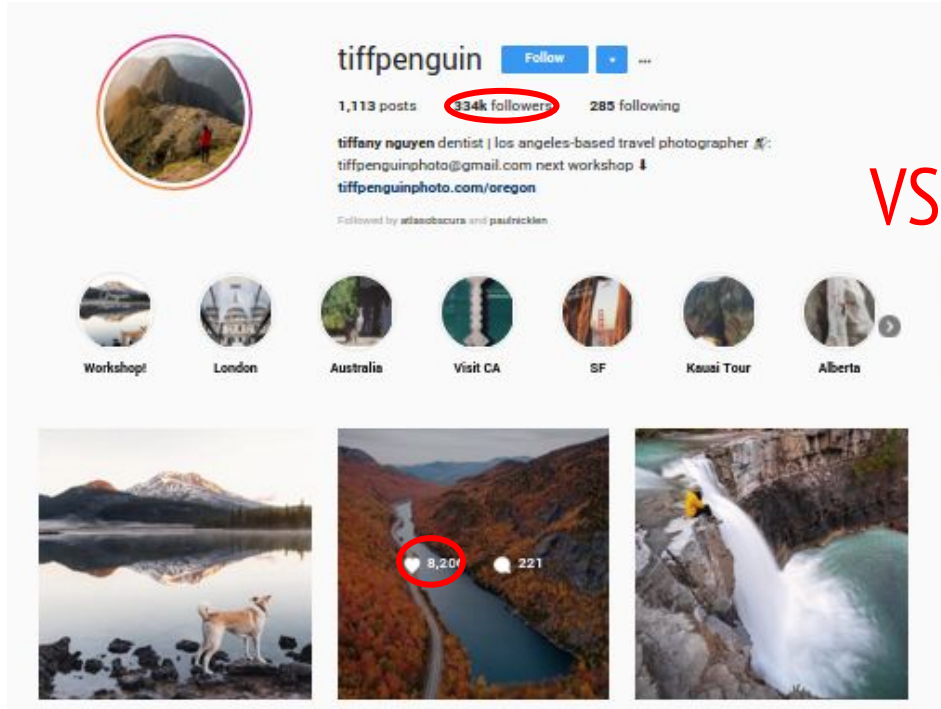


Similar to
accounts
you interact
with

Network Effects



Network Effects



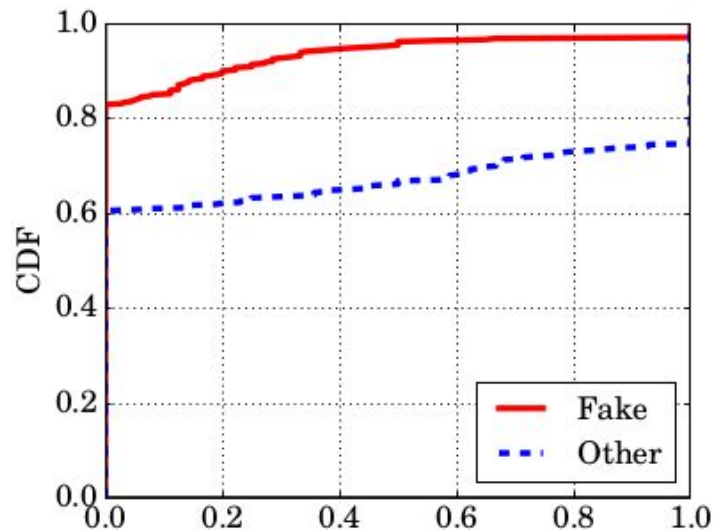
VS.



Who would you rather follow?

Network Effects

- Likes from followers and follower-of-followers are common
- Random likes have a higher proportion of follower-likers



Interest Overlap

- A user will like a post if she shares topical interests with the post
- To capture topical interest: Affinity
 - Extract topics
 - Find overlap

Extracting Topics

- Bio, post text and post image
- Wikification (annotating wiki-based entities) and Densecap (visual labeling) for images



Topics: 'Building', 'Summer', 'City', 'Color', 'Tourism', 'Road', 'History'

Extracting Topics

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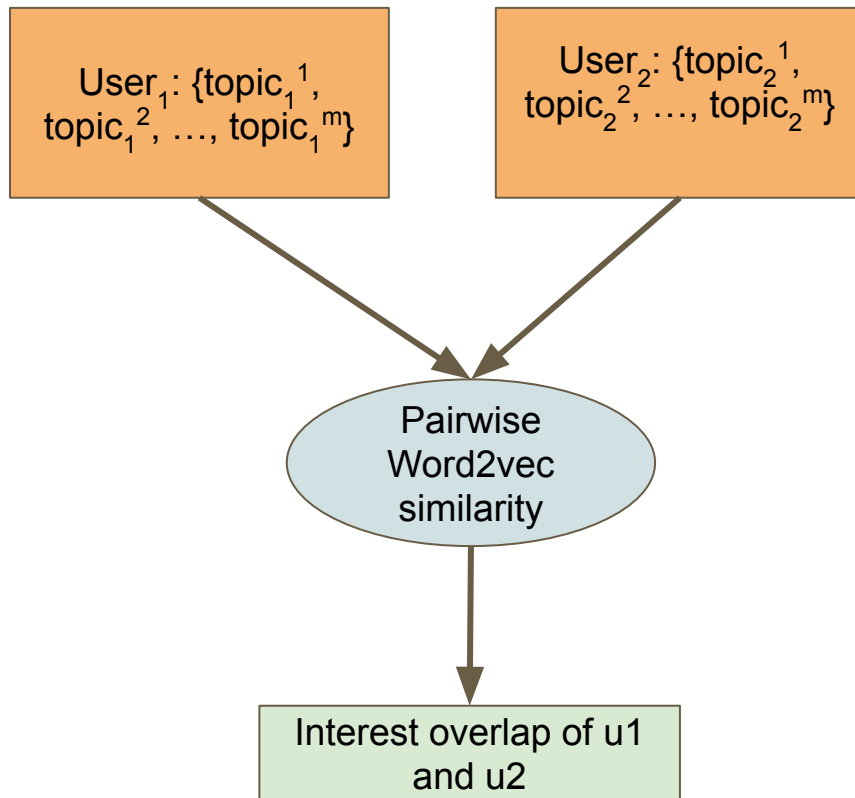
Topics: 'Building', 'Summer', 'City', 'Color', 'Tourism', 'Road', 'History'

Caption: 'window on the building'

Topics: 'Building', 'Window'

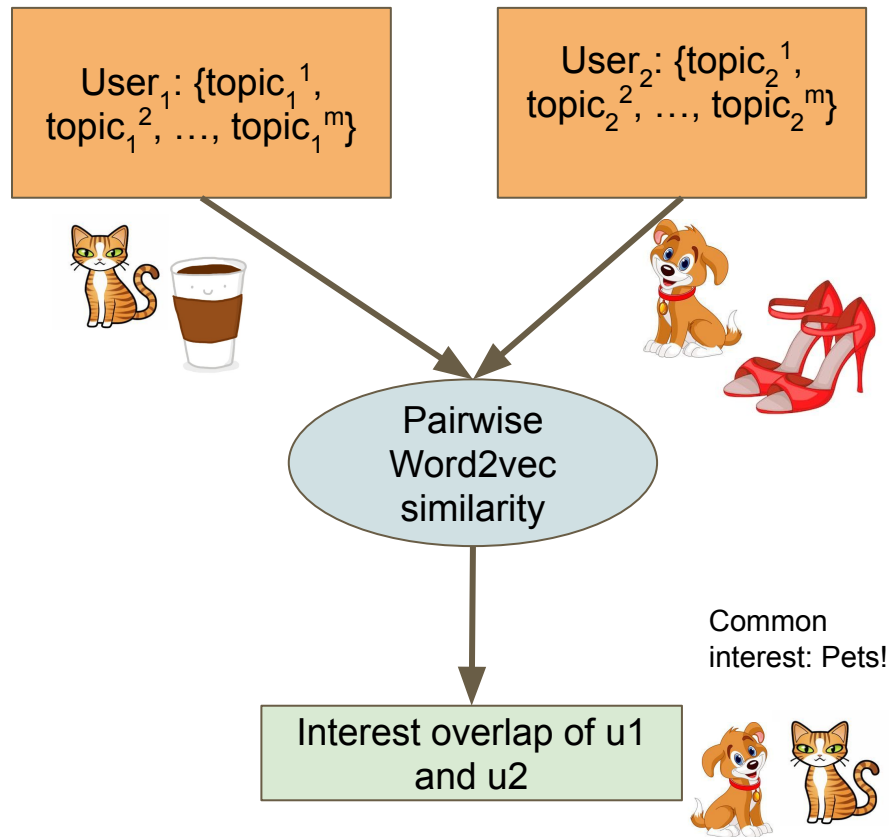
Interest Overlap

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- Affinity
- non-commutative



Interest Overlap

- A user will like a post if she shares topical interests with the post
- Affinity
- Non-commutative, captures hierarchical interests



Automatic Detection of Fake Likes: Baseline

- Baseline: Detecting Fake Likes on Facebook (Badri et al, CIKM'16)
- Use honeypots to identify fake likers
- Focuses on attributes of liker

Automatic Detection of Fake Likes

	Precision	Recall
LogReg	0.39	0.67
SVM (RBF)	0.58	0.65
Baseline	0.61	0.69
XGBoost	0.69	0.65
MLP	0.83	0.81

- Precision and Recall for detecting fake likes
- MLP gives the best performance

Automatic Detection of Fake Likes: Important Features

- **Interest overlap**
- **Network effects**
- **Profile completeness**
- Celebrities tend to get more likes (engagement)
- Genuine likers will keep coming back - repeated likers
- Link Farming hashtags: #like4like, #l4l, #like2follow
- Topical hashtags
- Posting activity of liker
- Profile picture of liker: egghead profiles (cheap to create)

Conclusion and Takeaways

- Error analysis uncovers affinity limitations
- Modeling relationship between liker-poster is vital!
- Fake likers are **not necessarily** fake users
- First step in finding true reach of a user

Thank You!

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