RealGraph: User Interaction Prediction at Twitter

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User Interactions at Twitter

If only Bradley’s arm was longer. Best photo ever. #oscars

- Reply
- Retweet
- Favorite
Directed Interaction Strength Estimation

TypeAhead Search
How to compare the directed interaction strength?
User Interaction Prediction

- Given a user pair \((u, v)\), PREDICT whether there is any interaction from \(u\) to \(v\) in the future.
- The probability of directed interaction is considered as the connection strength.
Real Graph Edge based Features

- Follow types
- Interaction types
- Interaction diversity
- Graph closeness: # common neighbors in the graph
- Topic based similarity
Interaction based Features

- Visible Interactions
  - A replies/retweets/favorites B’s tweet
  - A mentions B
  - A messages B
- Implicit interactions
  - A clicks on B’s tweet
  - A visits B’s profile page
Interaction based Features

- Non-zero days: the number of days when such an interaction happens
- Mean and variance: the mean and variance of interaction counts (computed over non-zero interaction days)
- Decayed count: a daily exponentially-decayed interaction count (EWMA)
Real Graph User based Features

- Country / Language
- User activity
  - # tweets, #retweets, # favorites
  - # follows, # followers
- User reputation
  - PageRank on the follow graph
## Performance of Feature Groups

<table>
<thead>
<tr>
<th>Feature group</th>
<th>AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical interaction ewma/mean</td>
<td>0.830</td>
</tr>
<tr>
<td>Historical interaction non_zero_days</td>
<td>0.849</td>
</tr>
<tr>
<td>Historical interaction diversity</td>
<td>0.849</td>
</tr>
<tr>
<td><strong>User reputation</strong></td>
<td>0.852</td>
</tr>
<tr>
<td>Graph closeness</td>
<td>0.853</td>
</tr>
<tr>
<td>Topic similarity</td>
<td>0.854</td>
</tr>
<tr>
<td><strong>User activity</strong></td>
<td>0.876</td>
</tr>
<tr>
<td>User country</td>
<td>0.877</td>
</tr>
<tr>
<td>Address book</td>
<td>0.877</td>
</tr>
</tbody>
</table>
User Survey

We’d love your help
Give us insight into your Twitter experience by taking a minute to answer a few questions.

Take the survey

14 days
10,982 responses

Below are ten people you follow. Please tell us how many Tweets from each person you find interesting.

@ZJYIN

- All or almost all of the Tweets
- Some of the Tweets
- A few or none of the Tweets

40% “All or almost all of the Tweets”
42% “Some of the Tweets”
18% “A few or none of the Tweets”
Applications

Who To Follow
Twitter accounts suggested for you based on who you follow and more.

User Similarity

Discover
Twitter is speeding up.
pewresearch.org/fact-tank/2014...
#Ferguson

I was blown away by this teacher: b-gat.es/1BzL7at
Thank you!

Q & A

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