#filterbubble

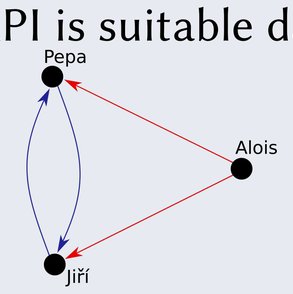
Filter Bubble

Living in one's own information environment.

- occures on social networks
- caused by preferential algorithms
- first mentioned by Eli Pariser (2011)

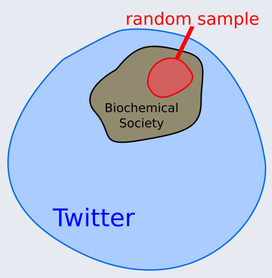
1. Twitter

- microblogging platform
- **following, followers** system
- Twitter API is suitable data source



2. Studied groups selection

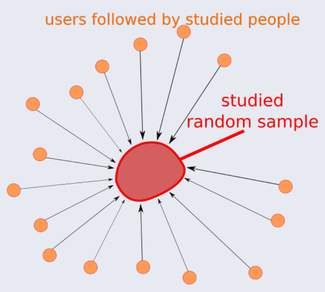
- random sample from followers of the significant group



Twitter → Biochemical Society → **studied people**

3. Tweets collection

- analysing content affecting the studied people



- i. e. content from **followed people**

4. Tweets filtering

- filter only tweets on given topic

Keyword "**Trump**":

✗ I had fish and chips for lunch.

✓ I'm glad Donald **Trump** is the president of the USA.

5. Sentimental analysis

- measure sentiment of collected tweets
- **positive** vs. **negative** tweets

Donald Trump is a terrible person.
(0.14)

Donald Trump is a great person.
(0.95)

Motivation

Our aim is to develop a new method for **detecting and measuring** *Filter Bubble* effects. This would provide us a new way to **study and avoid adverse effects** of *Filter Bubble*.

Threats for democracy:

1. content **homogeneity**
2. loss of objectivity
3. **radicalization**

Goals:

- filter bubble detection
- filter bubble quantification

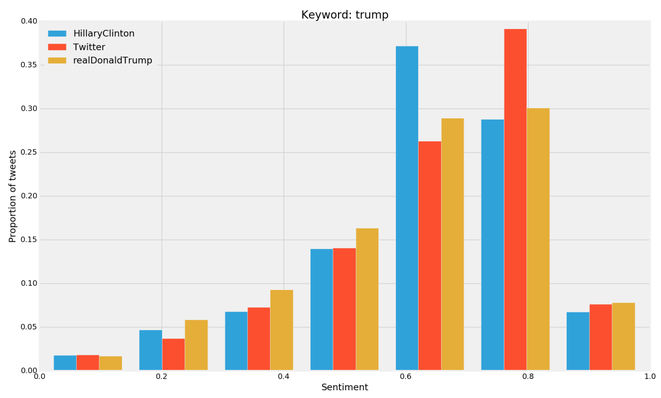
Measurements

Studied groups:

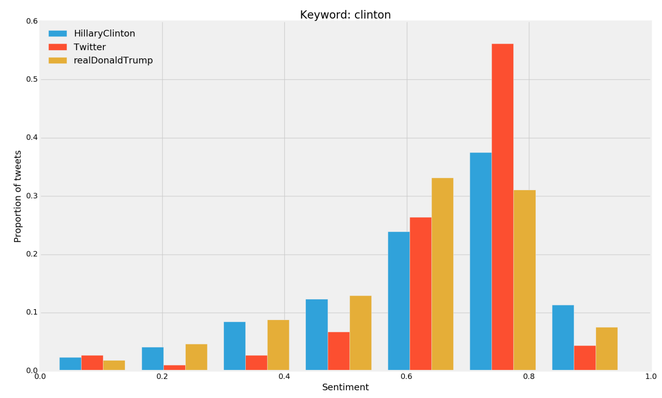
- Hillary Clinton's supporters
- Donald Trump's supporters

Topics:

- Hillary Clinton
- Donald Trump



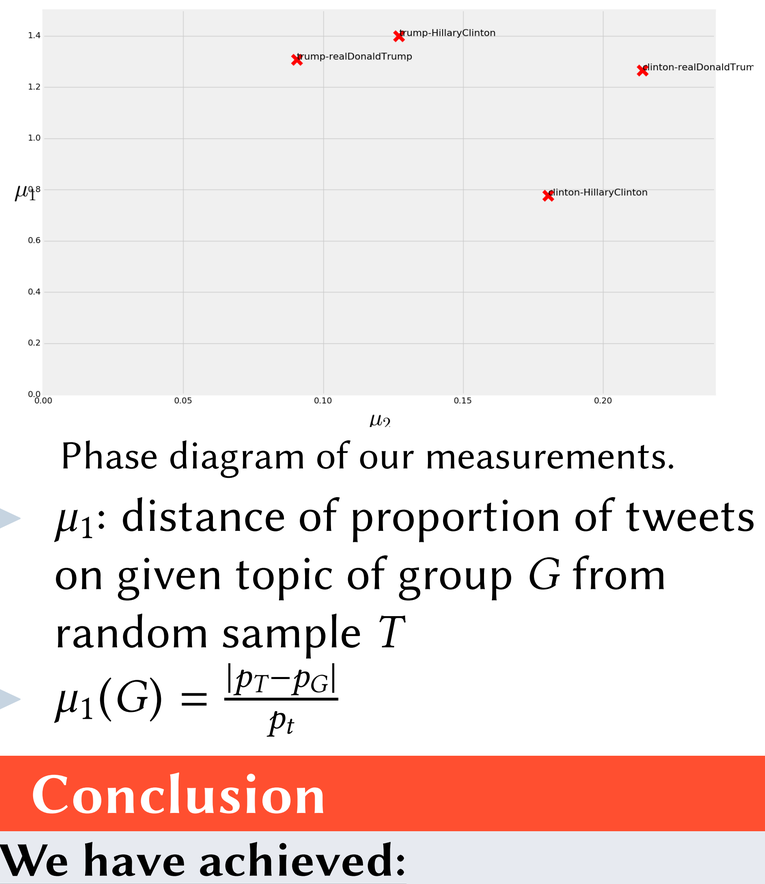
Normalized sentiment histogram for tweets about *Donald Trump*.



Normalized sentiment histogram for tweets about *Hilary Clinton*.

Proposed measure

A group affected by *Filte Bubble* is a group that finds itself in an information environment that is significantly different from the average environment.



Phase diagram of our measurements.

The environment may differ from average in two major ways:

1. the **number of tweets** on given topic (μ_1),
2. **sentiment distribution** (μ_2).

Further from origin means they receive **less balanced** information.

- μ_1: distance of proportion of tweets on given topic of group G from random sample T
- $\mu_1(G) = \frac{|p_T - p_G|}{p_t}$
- μ_2: distance of sentiment histogram of group G from random sample T
- $\mu_2(G) = \sqrt{\sum_i \left(S_T^i - S_G^i\right)^2}$

Conclusion

We have achieved:

1. To the best of our knowledge - **the first measure** of *Filter Bubble* proposed.
2. Large scale measurements → data **noise reduction**.
3. More **straightforward** than traditional research.

Future plans:

1. **Real world** usage.
2. Modify methodology for use **outside the Twitter**.
3. Develop measure that encodes information about **direction of sentiment difference.**

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