Web Science - Network Analysis Project

Analysing the twitter Search Network and the facebook Like/Comment Network for Two Recent Movies:

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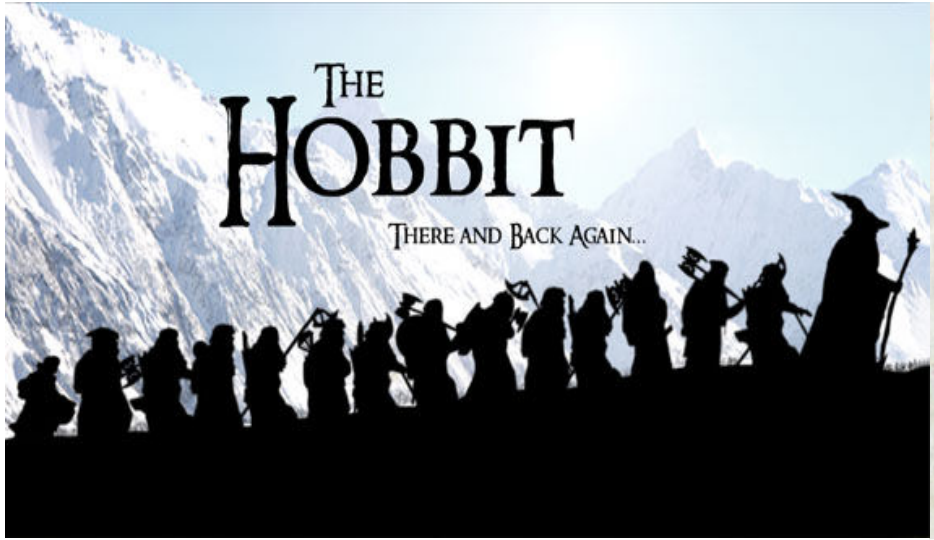
The Hobbit and *The Interview*



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Introduction

twitter →

- the Twitter search network;
- most popular posts from seven days in the past;
- directed graph;
- edges between the user who posted and the users who have retweeted;

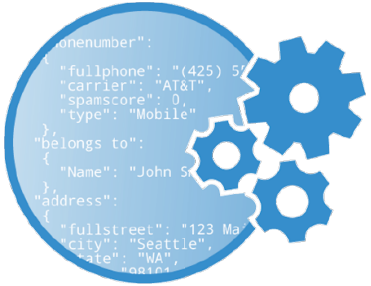
facebook →

- the Facebook fan page like/comment network;
- posts from release dates;
- longitudinal network;
- undirected graph;
- edges between the users who liked/commented on the same post.

Collecting the data

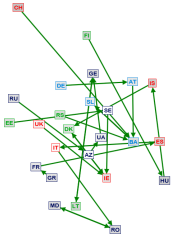
For a short example of how Twitter utterly failed us, see below. We tried to search for “franc” (CHF).

- incredibly challenging and frustrating;
- limited APIs and failing existing tools;
- decided to “take matters into our own hands” (for Twitter, at least).



Facebook Graph API

Twitter API



Node XL

Collecting the data: Twitter failing, step 1

Service

https://api.twitter.com/1.1

Authentication

twitter-MihaiVarga13

Request URL

GET

https://api.twitter.com/1.1/search/tweets.json?q=franc

Send

Query* Template Headers

Request

```
GET /1.1/search/tweets.json?q=franc
HTTP/1.1
Authorization: OAuth
oauth_consumer_key="DC0sePOBbQ8bYdC8r4Smg",oauth_signatu
SHA1",oauth_timestamp="1421349517",oauth_nonce="29549990
OdhZLeeFeQK8hAk6XdsnixxE6rgVBIi1xA2CAvZ",oauth_signature
Host: api.twitter.com
X-Target-URI: https://api.twitter.com
Connection: Keep-Alive
```

Response Snapshot


```
    },
    {
      "metadata": {
        "iso_language_code": "en",
        "result_type": "recent"
      },
      "created_at": "Thu Jan 15 19:17:34 +0000 2015",
      "id": 555806014264459260,
      "id_str": "555806014264459264",
      "text": "RT @TheEconomist: The Swiss Franc shocked
markets this morning, rising by over 30% in just a few
minutes. Why? http://t.co/XXSqjuHVDD http:…",
      "source": "<a href="http://tapbots.com/tweetbot"
rel="nofollow">Tweetbot for iOS</a>",
      "truncated": false,
      "in_reply_to_status_id": null,
```

Collecting the data: Twitter failing, step 2

Service

https://api.twitter.com/1.1

Authentication

twitter-MihaiVarga13

powered by apigee

Request URL

GET

https://api.twitter.com/1.1/statuses/show/555806014264459264.json

Send

Query | **Template*** | Headers

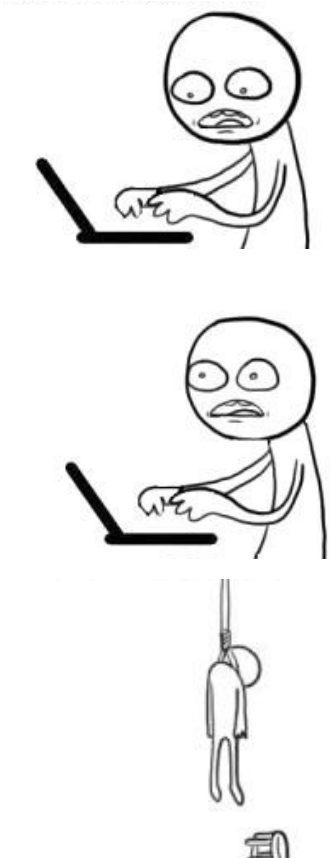
Request

```
GET
/1.1/statuses/show/555806014264459264.js
HTTP/1.1
Authorization: OAuth
oauth_consumer_key="DC0sePOBbQ8bYdC8r4Smg",oauth_signatu
SHA1",oauth_timestamp="1421349616",oauth_nonce="1145009
OdhZLeeFeQK8hAk6XdsnixxE6rgVBIi1xA2CAvZ",oauth_signature
Host: api.twitter.com
X-Target-URI: https://api.twitter.com
Connection: Keep-Alive
```

Response Snapshot


```
    "following": false,
    "follow_request_sent": false,
    "notifications": false
  },
  "geo": null,
  "coordinates": null,
  "place": null,
  "contributors": null,
  "retweet_count": 471,
  "favorite_count": 242,
  "entities": {
    "hashtags": [],
    "symbols": [],
    "user_mentions": [],
    "urls": [
      {
        "url": "http://t.co/XXSqjuHVDD",
```

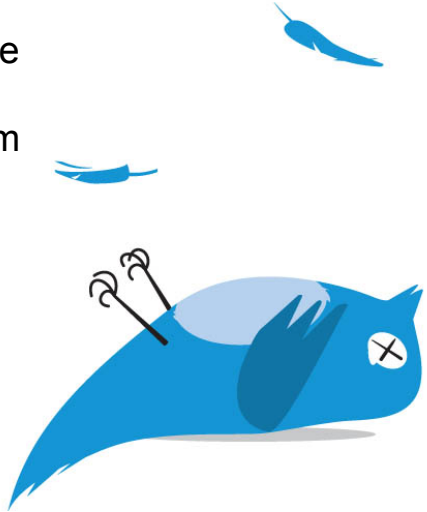
Collecting the data: Twitter failing, step 3



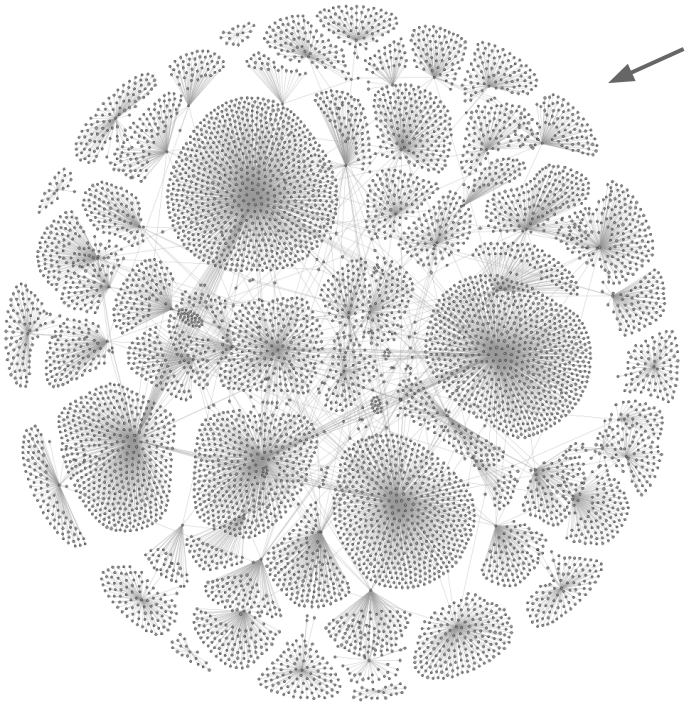

```
x-transaction: 9b6e20762ab240ab
pragma: no-cache
cache-control: no-cache, no-store, must-revalidate,
pre-check=0, post-check=0
x-connection-hash: 81506e97c015e80ef39befcb4cf23fb7
x-xss-protection: 1; mode=block
x-content-type-options: nosniff
x-rate-limit-limit: 15
expires: Tue, 31 Mar 1981 05:00:00 GMT
set-cookie: lang=en
set-cookie: guest_id=v1%3A142134994046295984;
Domain=.twitter.com; Path=/; Expires=Sat, 14-Jan-2017
19:25:40 UTC
content-length: 94
x-rate-limit-reset: 1421350840
server: tsa_b
x-twitter-response-tags: BouncerCompliant
strict-transport-security: max-age=631138519
x-access-level: read-write-directmessages

{
  "ids": [],
  "next_cursor": 0,
  "next_cursor_str": "0",
  "previous_cursor": 0,
  "previous_cursor_str": "0"
}
```

Collecting the data

- Solving the issues:
  - registered an app on Twitter and wrote a small custom Python tool to retrieve data;
  - used an older version of Node XL to collect (limited) data from Facebook pages.
- Quality of the data:
  - the Twitter API is very limited => we couldn't collect all the data we desired;
  - only collected likes and comments from Facebook with a maximum depth of 50, so that Gephi would be able to parse the graph file.



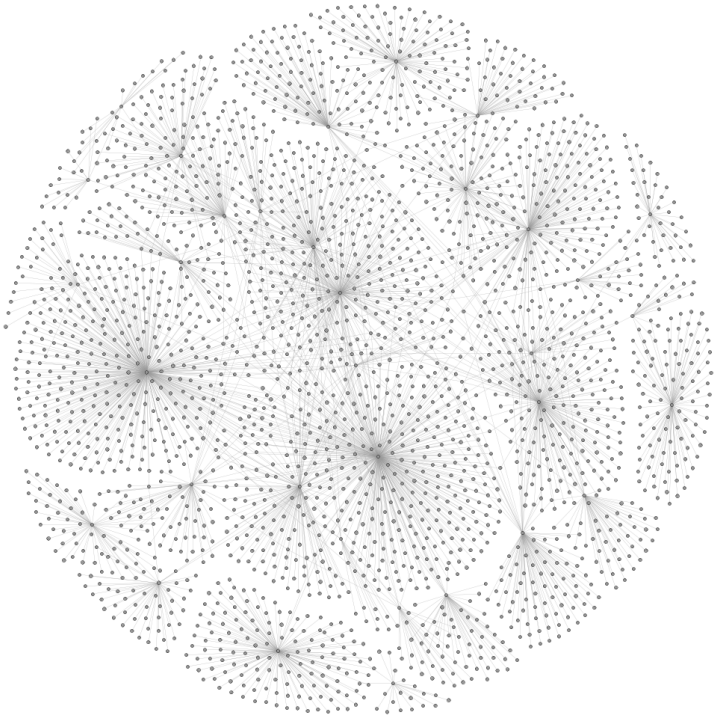
The Twitter networks: the Fruchterman-Reingold layout



The Interview

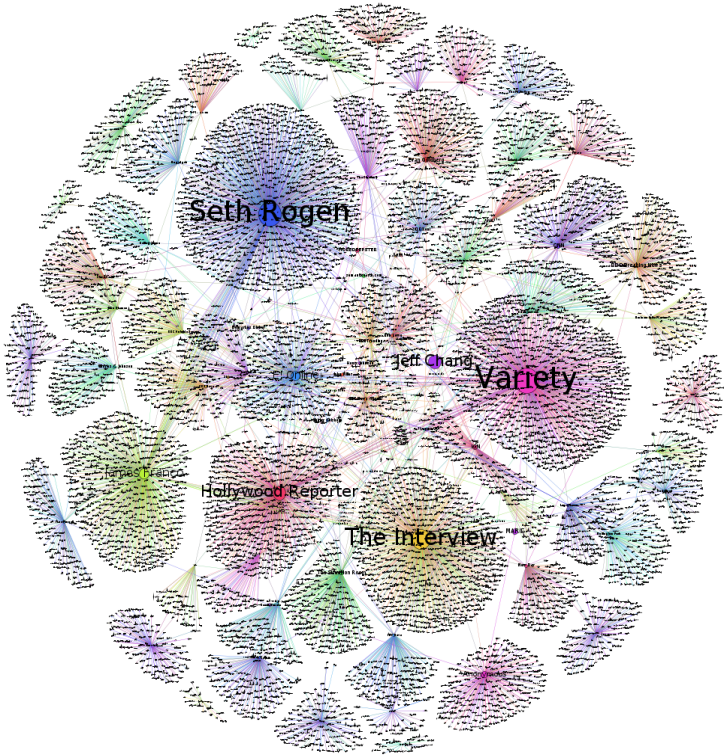
The Interview:
7 872 nodes;
8 152 edges;
avg degree ~= 1;
diameter = 2;
13 connected components

The Hobbit:
2 646 nodes;
2 908 edges;
avg degree ~= 2;
diameter = 2;
5 connected components



The Hobbit

The Twitter networks: betweenness centrality

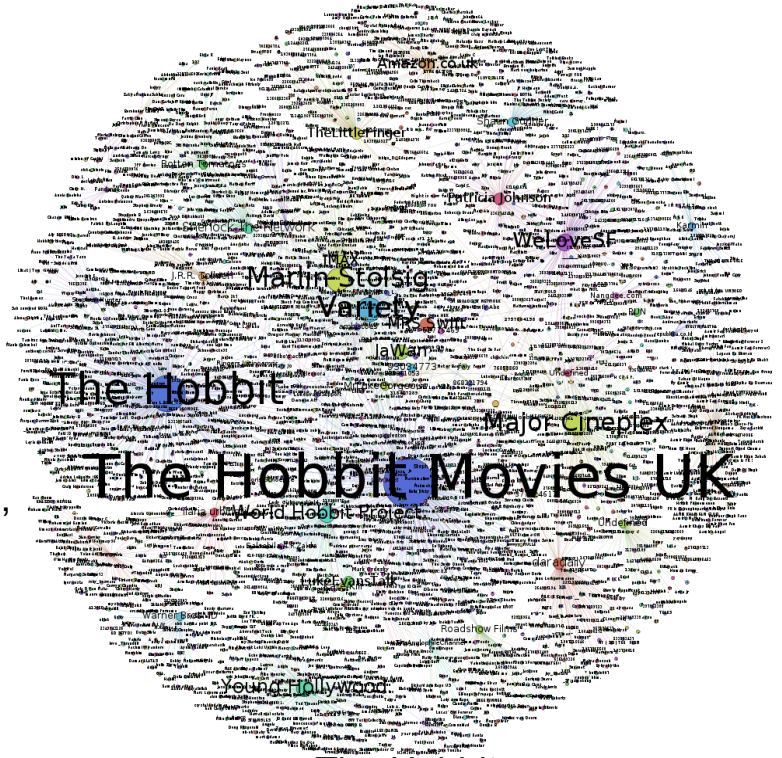


The Interview

Release dates:

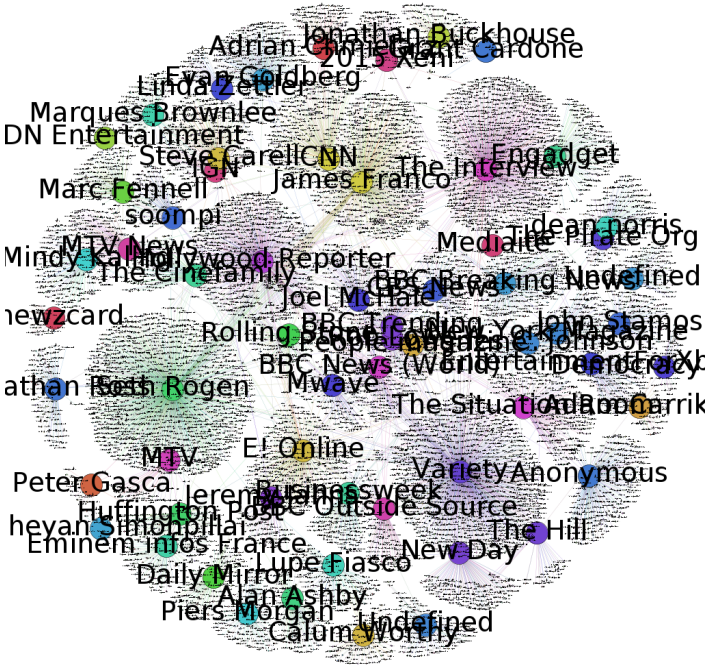
The Interview:
US - 11.12, Christmas (limited, internet);

The Hobbit:
London, Paris - 1, 2.12;
US - 4.12;
Europe - 10-12.12;
Christmas - Cambodgia, Iceland.

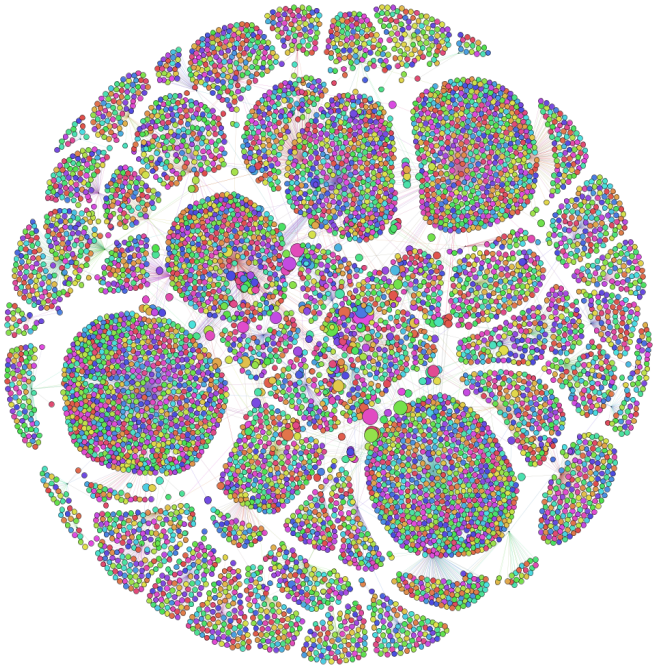


The Hobbit

The Twitter networks: hubs and authorities



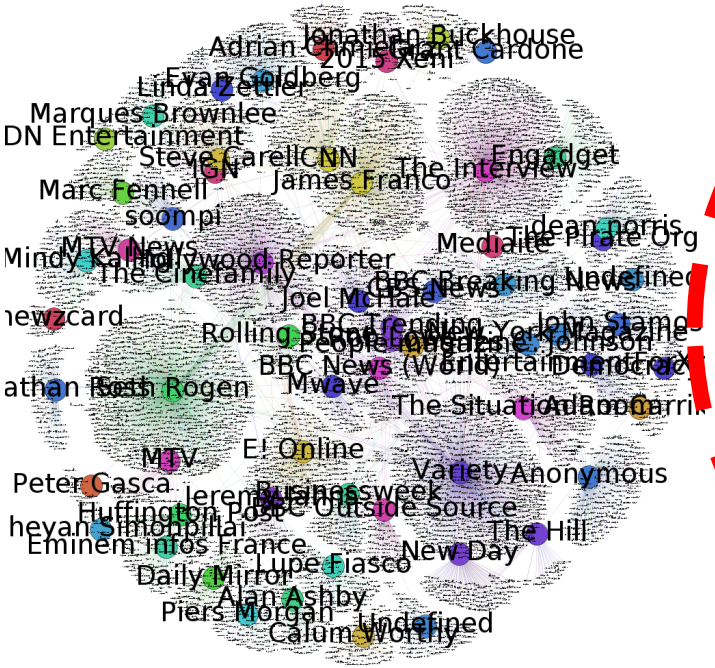
Hubs



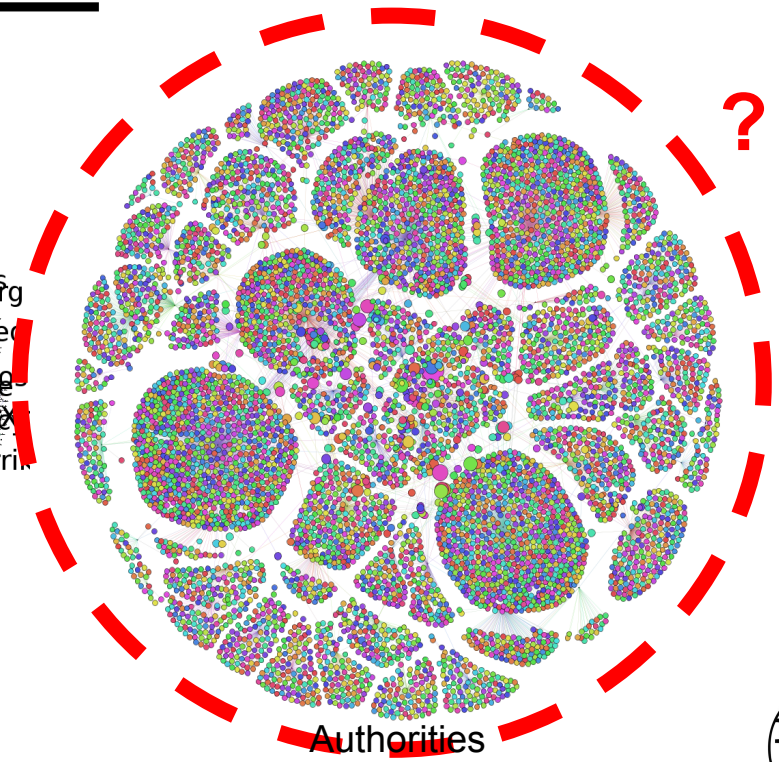
Authorities

The Interview

The Twitter networks: hubs and authorities

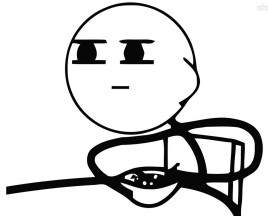


Hubs



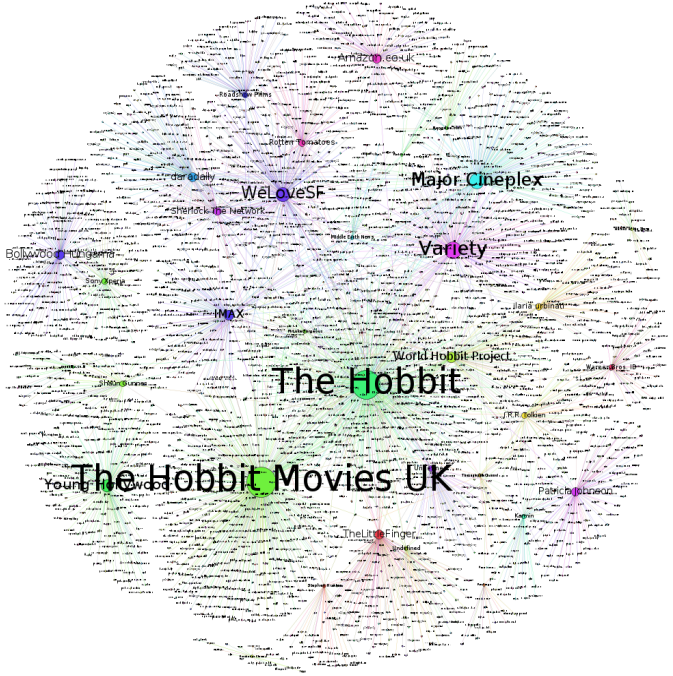
Authorities

The Interview



The Twitter networks: hubs and authorities

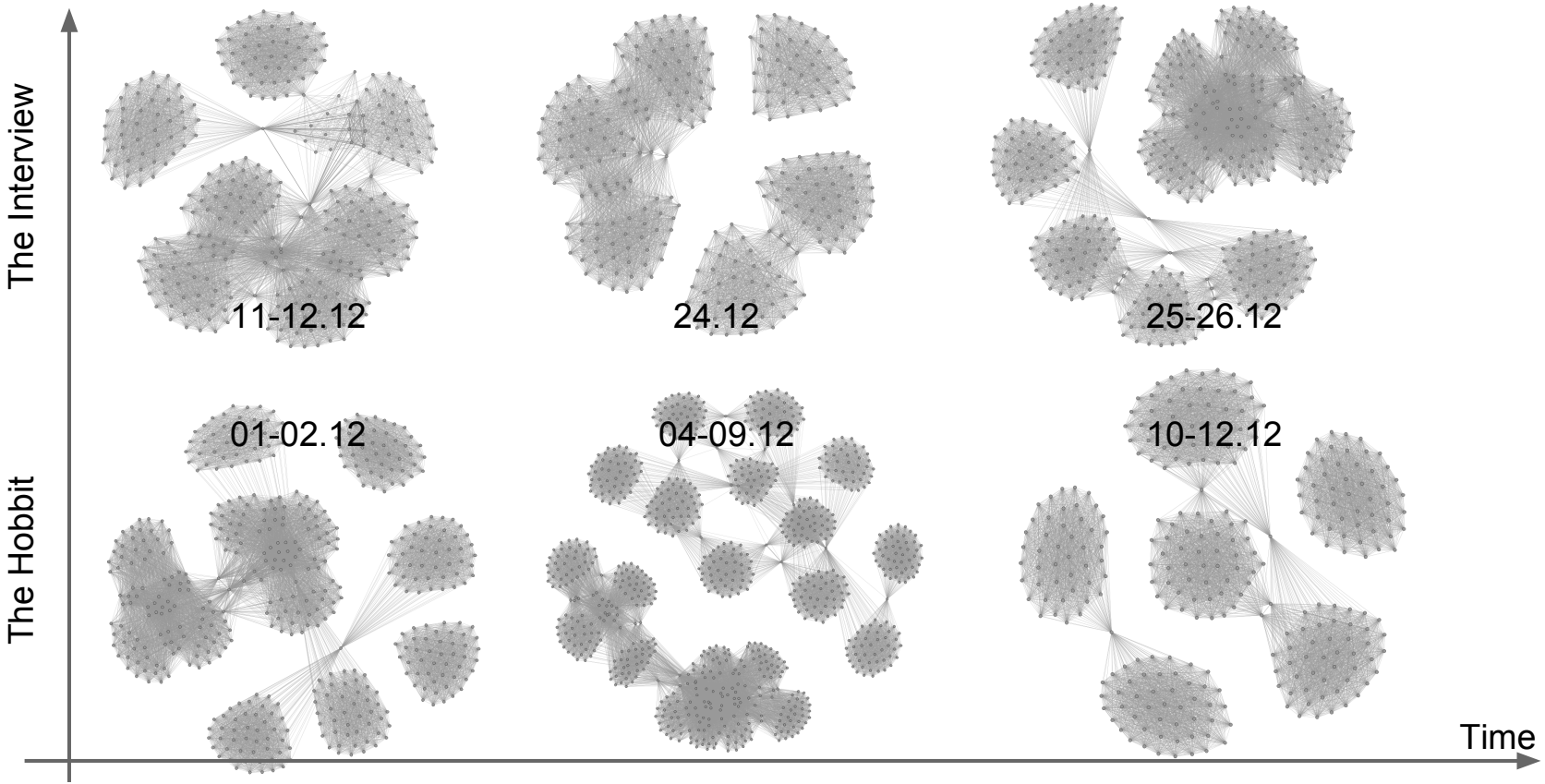
Hubs



Authorities

The Hobbit

The Facebook networks: the Fruchterman-Reingold layout



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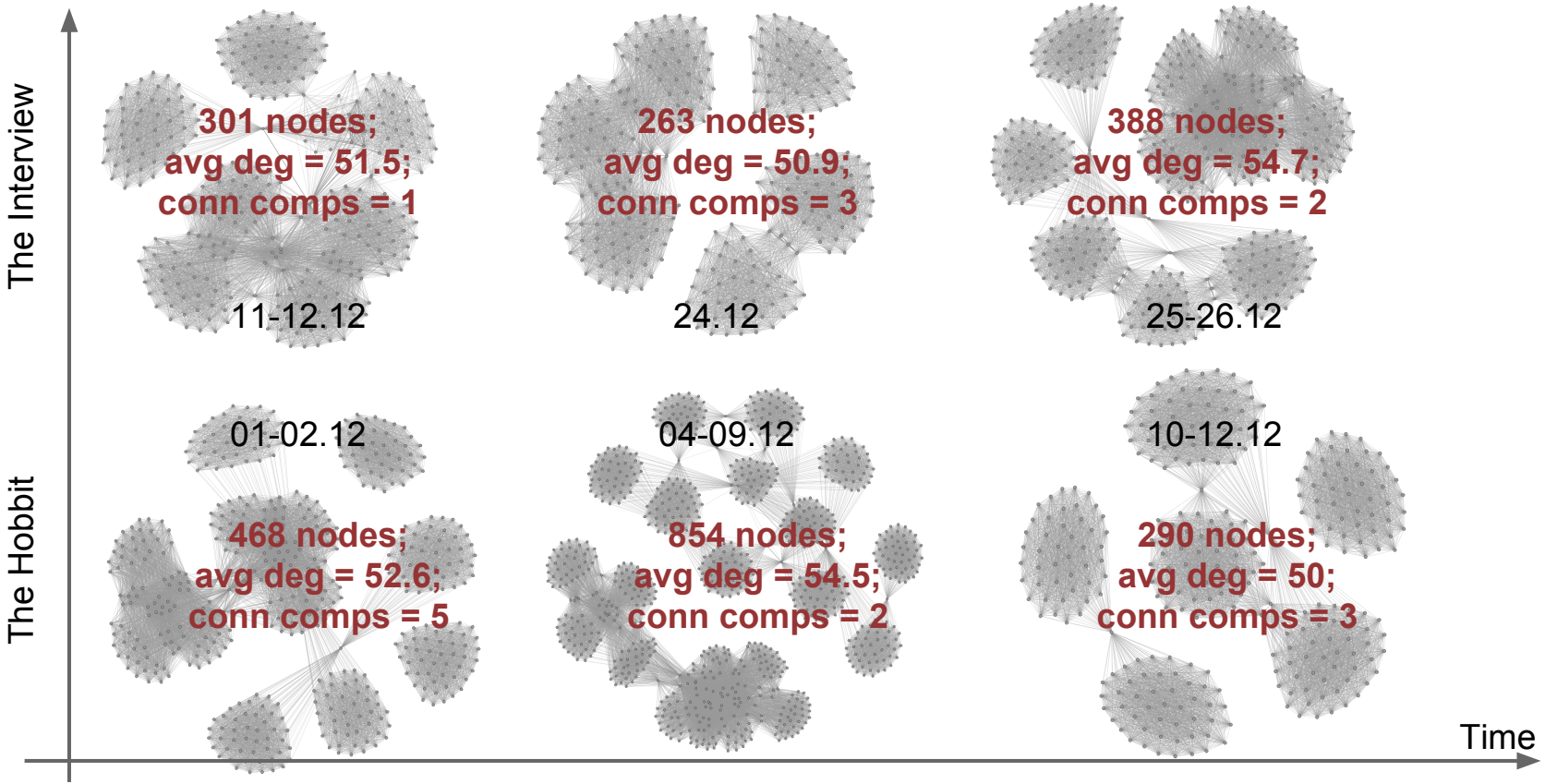
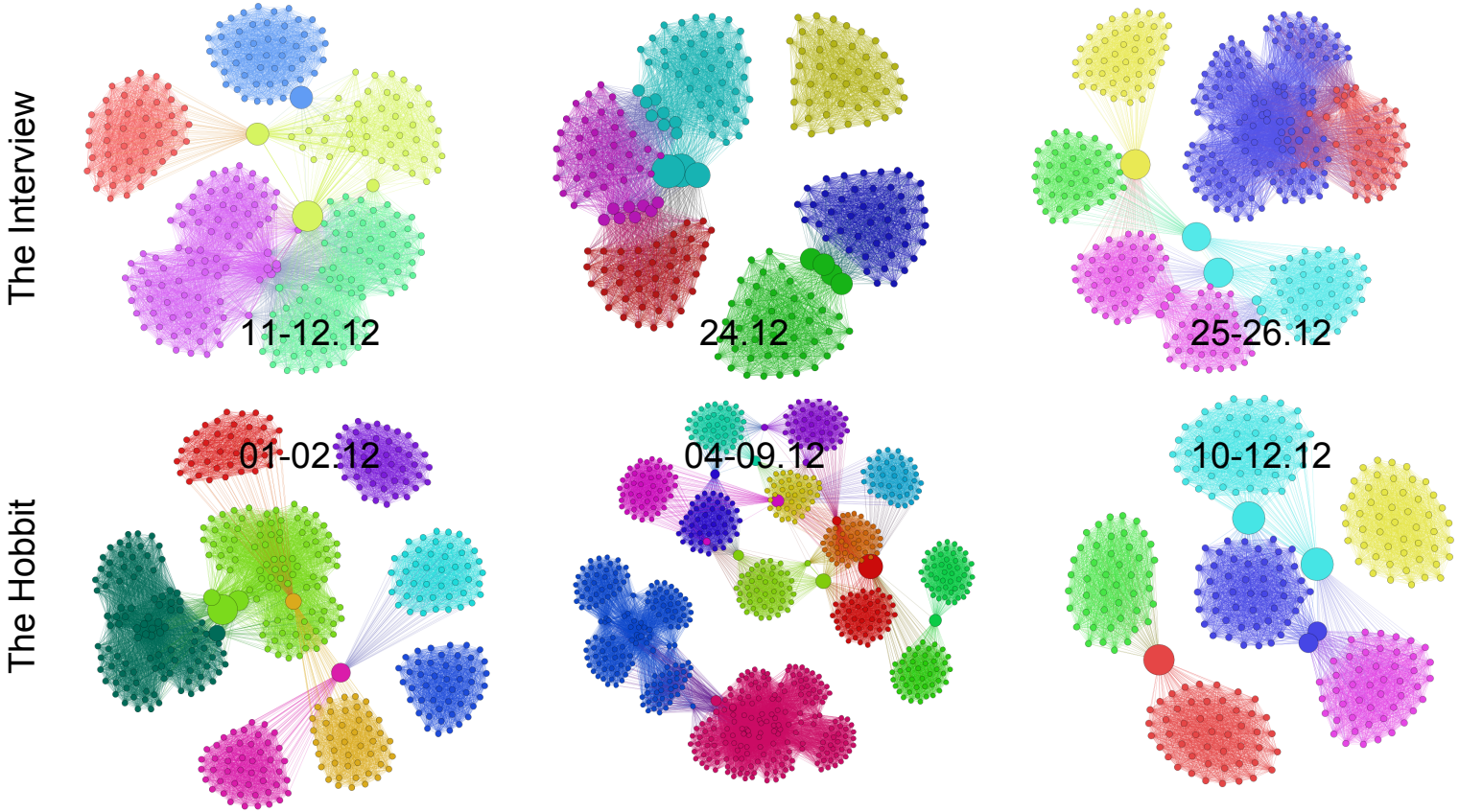


The Facebook networks: communities



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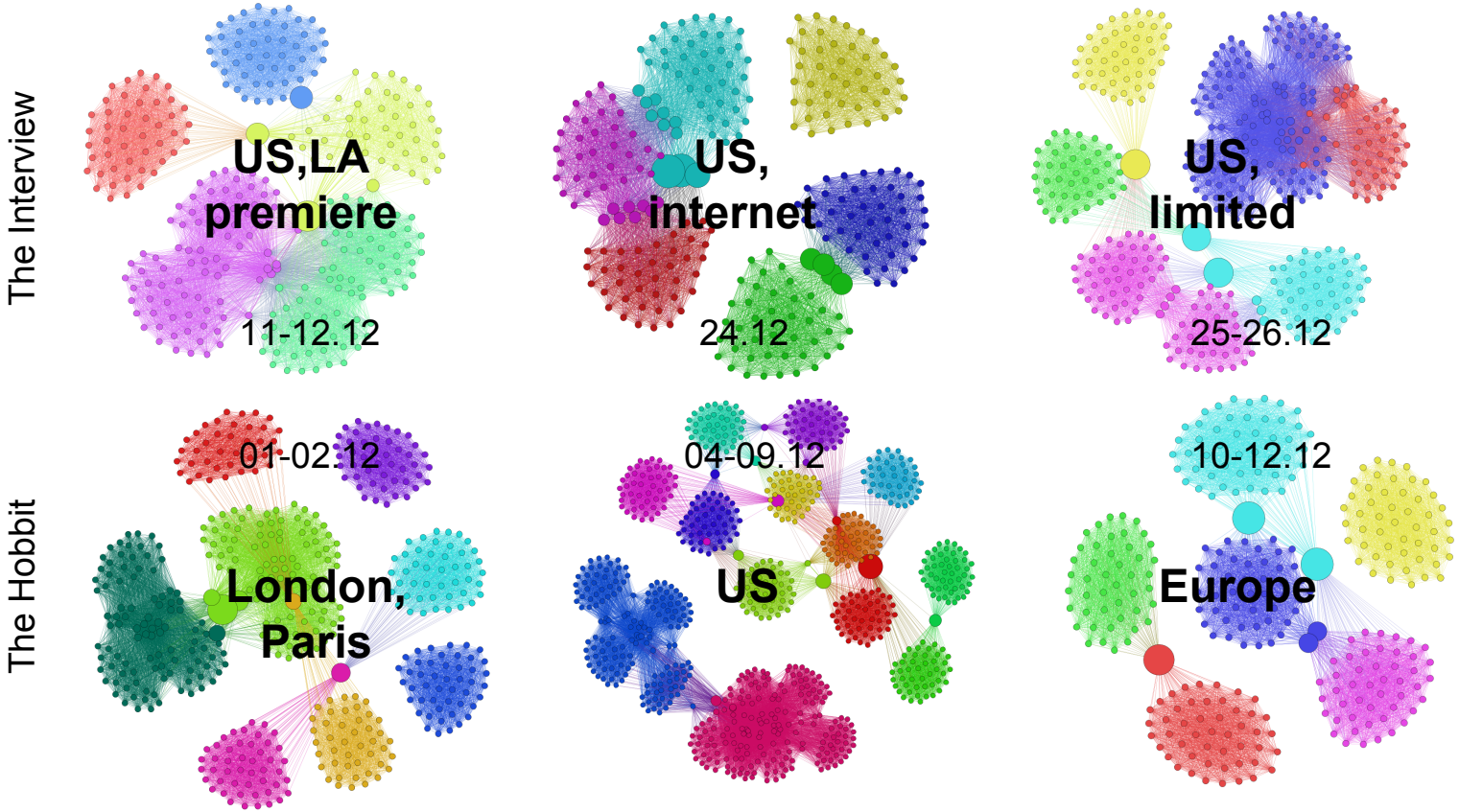

Conclusions

	twitter	facebook
The Interview	- directed network; - bigger than ‘The Hobbit’; - no proper authorities and hubs; - sparser than ‘The Hobbit’.	- undirected network; - doesn’t change much in time; - few brokers.
The Hobbit	- directed network; - seems more “connected” than ‘The Interview’ network; - hubs and authorities.	- undirected network; - seems more active around the US release; - more brokers than ‘The Interview’,

Thank you !