Diversity seeking users and their influence on a social news site
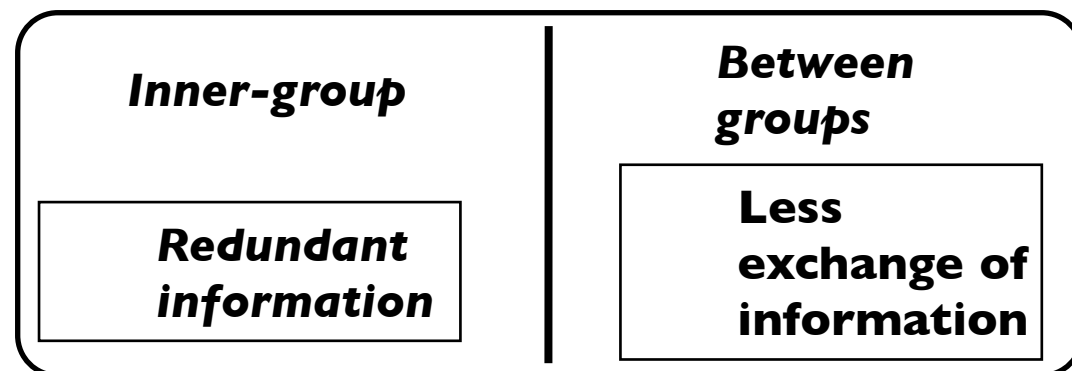
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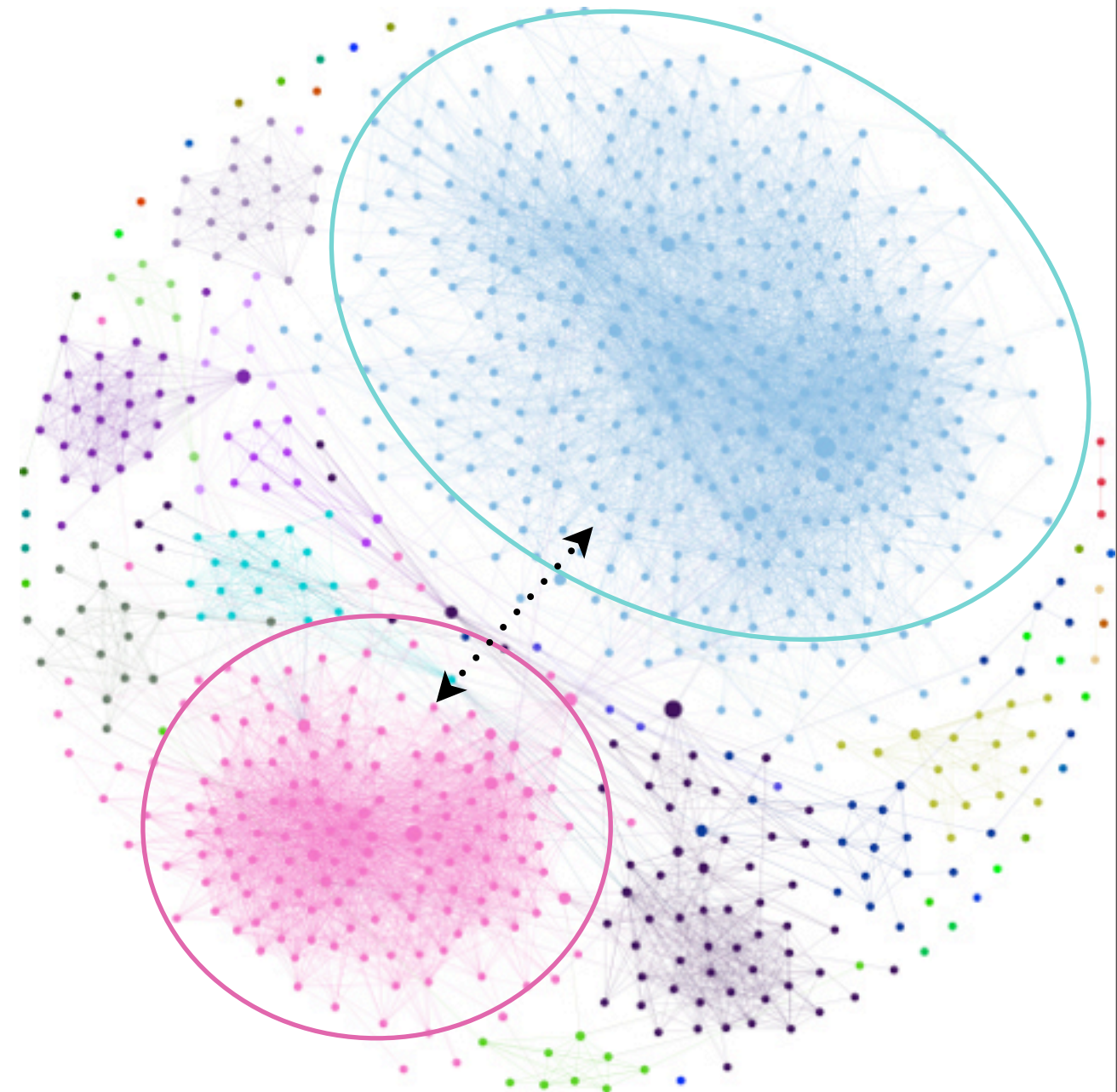# 1. Research Motivation - Why diversity-seeking users?

Birds of a feather in news media
Less diversity in individual's social network

Social fragmentization -
More distinctive/separated groups made

Inner-group	*Between groups*
Redundant information	**Less exchange of information**

Whole network can no longer exchange information efficiently

1. Research Motivation - Focusing on Diversity-seeking users

○ We look at diversity-seeking users,

- Who do not persist homophilic bindings,

- Who are interested in various kinds of topics,

- Who interact with various kinds of people.

○ Our hypothesis is :

- Diversity-seeking users function as bridges that connect fragmentized groups and draw more influence than others.

1. Background - about datasets

○ We retrieved data from Huffington Post

Articles   Comments   Connections / users

2. Finding diversity-seeking users

User's Topic distribution

⭕ We use TF-IDF and LDA to make user X's topic distribution

1. Retrieve each article's keywords using TF-IDF.

2. Make user X's keyword sets by gathering the articles which user X wrote comments on.

3. Apply LDA on users' keyword sets.

User X's topic distribution

0.12	0.23	0.32	...	...	...	0.06

Topic 1
(ex: Presidential election)

Topic 3
(ex: Gay marriage)

Topic 50
(ex: Health Care)
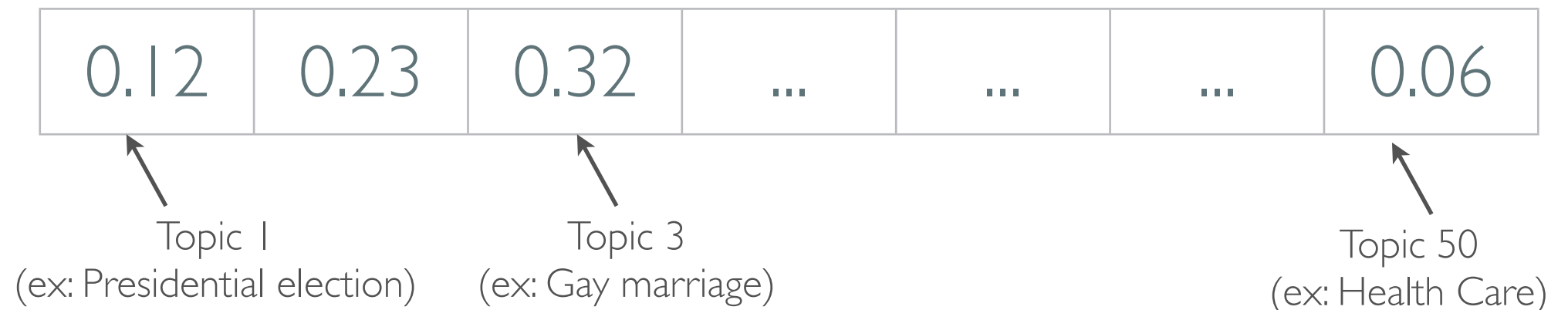
2. Finding diversity-seeking users

User's Social Diversity

$$SD(i) = (1 - \overline{TS(i)}) * \sqrt{\frac{1}{|f(i)|} \sum (TS(i,j) - \overline{TS(i)})^2}$$

•⁘·High SD

1. Low mean
   topic similarity between the user and friends.

2. High variance of
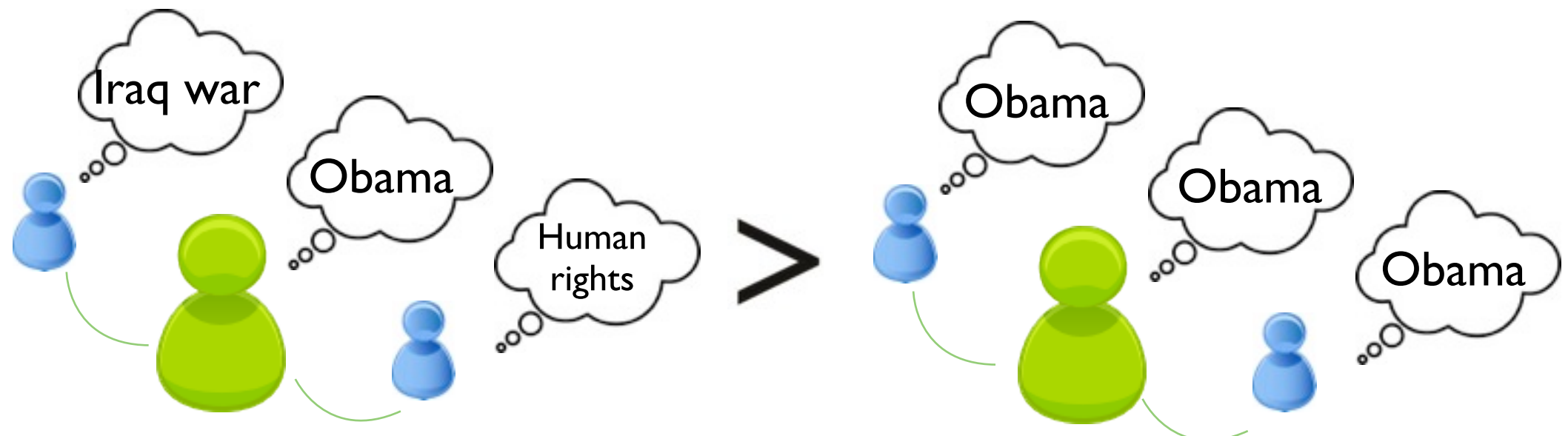
* f(i): user i's number of friends
  TS(i,j): Cosine similarity between user i and j's topic distribution

Social diversity

3. Structural hole spanners

🔴 : structural hole spanners

○ Social network is consisted of multiple densely knitted clusters.

○ Users who are located in 🔴 tend to be more influential than others because they can have the benefit of conveying non-overlapping information from one cluster to other clusters.

○ Therefore, structural hole spanners are influencers in the social network.
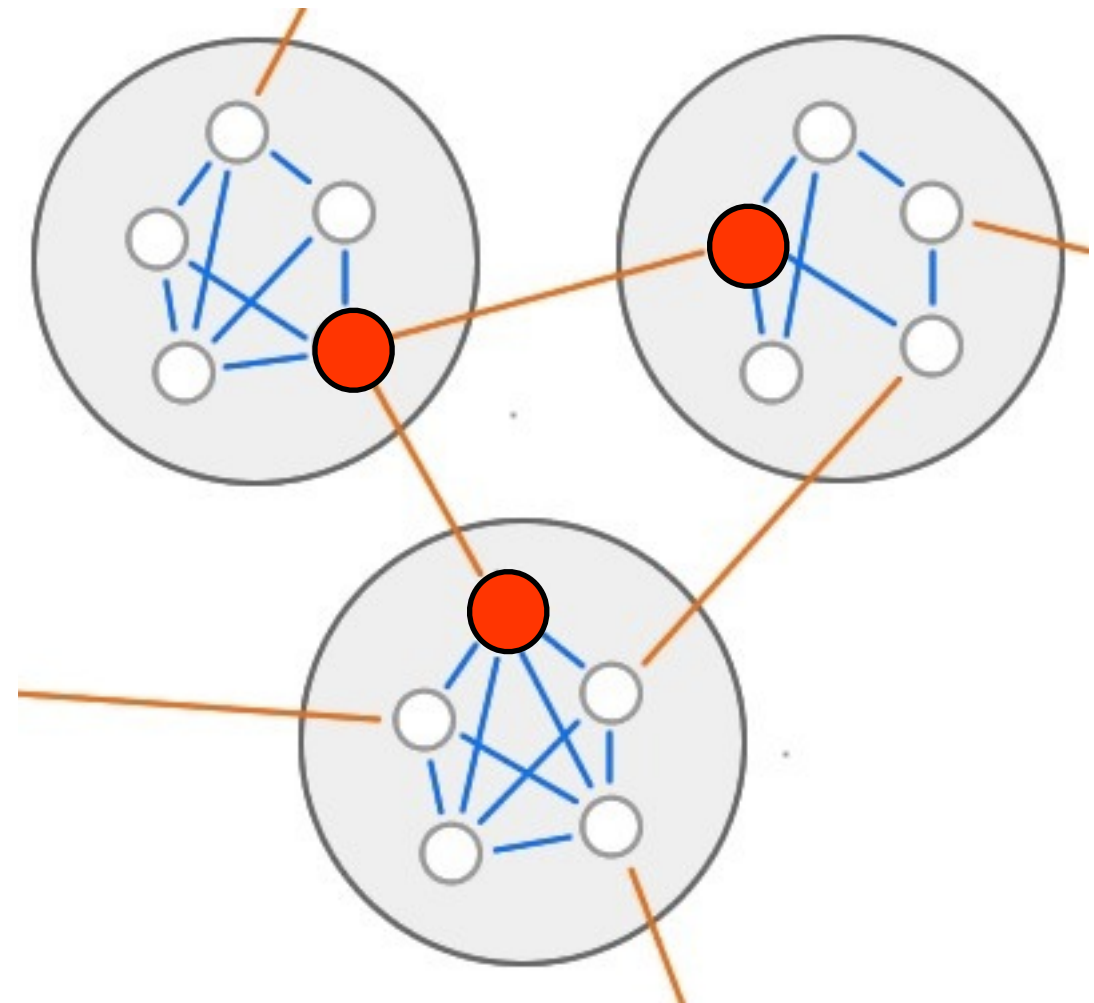
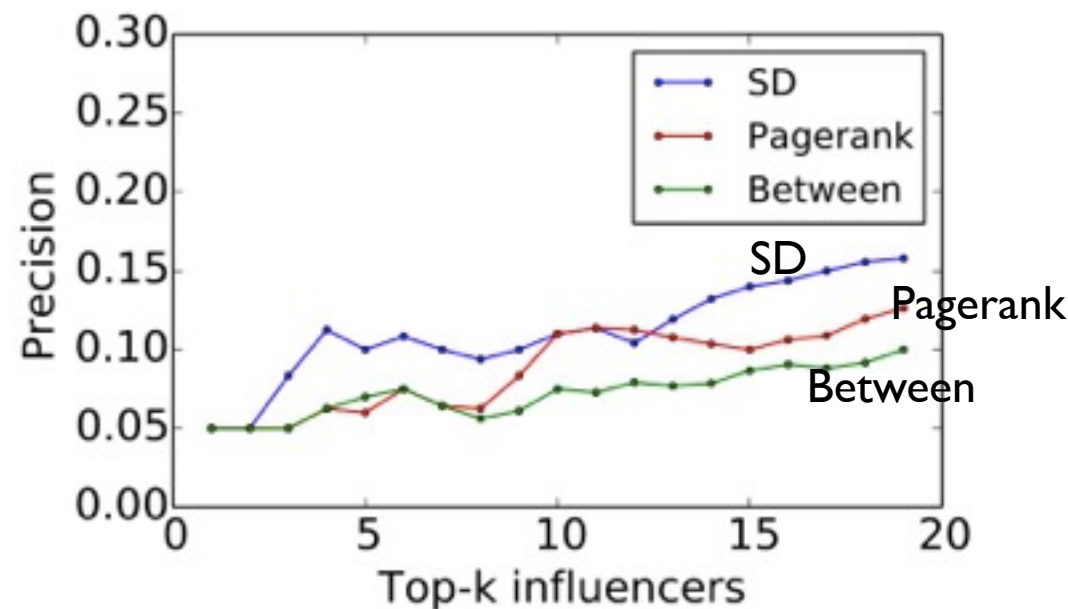# 3. Finding structural hole spanners using Social Diversity
Experiment setup

○ When a user writes a comment on an article, and if the user's friends write comments below him/her, we assume that the friends are influenced by the user who first wrote the comment.

○ We divided the entire social network into several domains, and for each user, define inner and outer domains. Users who have high influence on outer domains rather than on inner domain are structural hole spanners.

○ We will show that social diversity can used to find structural hole spanners.

Influence

3. Finding structural hole spanners using Social Diversity

○ Out experiment is designed to find top-k structural hole spanners using top-k users having highest social diversity

○ Pagerank and betweenness centrality is used to be compared with social diversity

(Structural hole spanners)

○ **Social diversity finds structural hole spanners with higher precision than pagerank and betweenness centrality.**

○ Social diversity is not very useful in finding inner domain influencers.

Thank you for listening!