

Diversity seeking users and their influence on a social news site

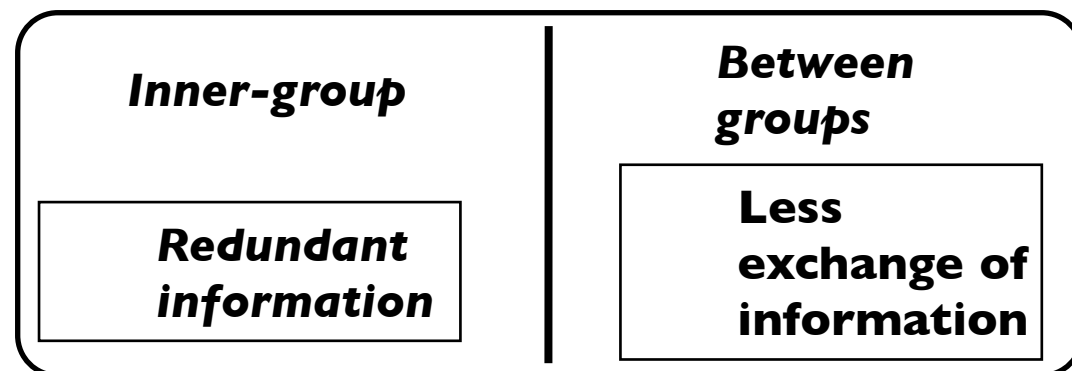
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I. Research Motivation - Why diversity-seeking users?

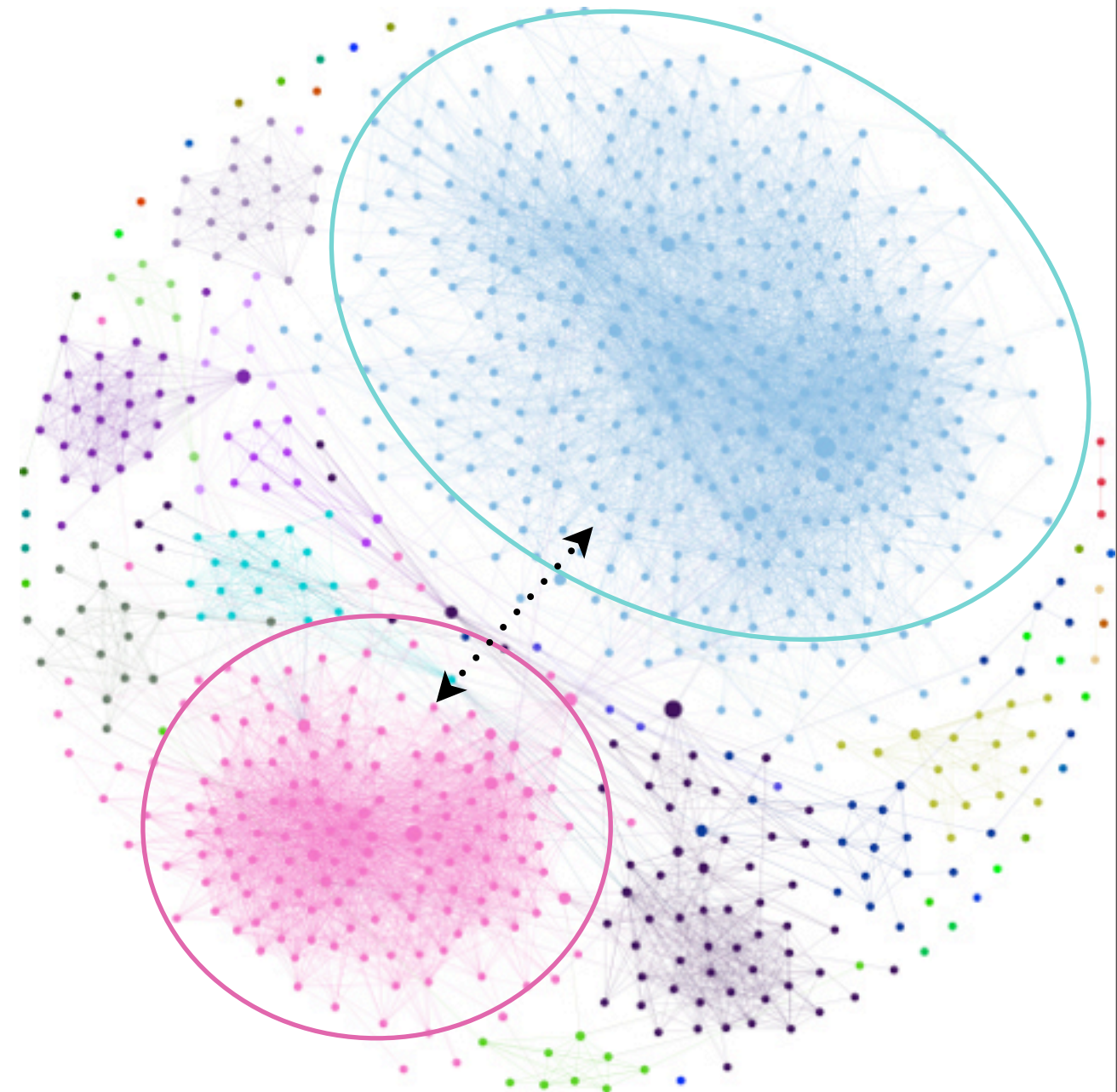
Birds of a feather in news media
Less diversity in individual's social network



Social fragmentation -
More distinctive/separated groups made



Whole network can no longer exchange information efficiently



I. 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.

I. Background - about datasets

○ We retrieved data from Huffington Post

Rand Paul: Texas Could Turn Blue If Republicans Don't Adapt

The Huffington Post | by Melia Reilly
Posted: 02/04/2014 10:40 am EST | Updated: 02/04/2014 10:50 am EST



1k 223 24 17 2k 0.1k
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WORD: Texas, Politics News, Rand Paul, Texas Democrats, Texas Politics, Rand Paul Texas Blue, Republican Party, GDP, Rand Paul Texas, Republican Party, Wendy Davis, Rand Paul GOP, Politics News

Sen. Rand Paul (R-Ky.) said his former home state of Texas could easily turn blue if Republicans fail to adapt to shifts in the state.

Speaking at a dinner hosted by the Harris County Republican Party in Houston, Texas on Saturday, Paul warned that the Lone Star State "will be a Democratic state within 10 years if you don't change."



Andy A. (andy_txn)

★ 93

718 Fans · Riding a blue Tsunami over a red sea

"Rand Paul: Texas Could Turn Blue" sorry Rand, we are already turning from purple to blue. Every day thousands of people are being registered to vote, some people are dusting off their voter registration cards, which hadn't been used in 14 years, to see if they need to be adjusting to meet the Republican suppression laws voted in. The Koch bros are pouring \$million\$ of \$\$\$ to support the obstruction, suppression, oppression that is going on in Texas. Now (!)reasonous Karl Rove is jumped into the races in Texas trying to beat down the citizens of Texas. We are many & growing, we are strong, we will win !
10 FEB 2:34 AM

REPLY FAVE SHARE MORE

HuffPost Social News

Carol Stephens Brier...
HuffPost super user
Member Since May 2010
Comments (8094) | Friends (1308)

Report Abusive Profile
Follow this Member

Comments Fans

View Fans Sorted by: Newest First

Friends (1208)

LiberalKate	jayler	NEVAG
newkashape	OTree	RaymondTX
Liban CZ	Marcy Semanin	MaMi
Chuck My Finley	meskip	New England Patriot
The Real Randall F...	GeoneTom	goffeman
jma	StrongDemocrat	Amenda/19
Danika	carefreepeople	Magnatund

Articles

Comments

Connections / users

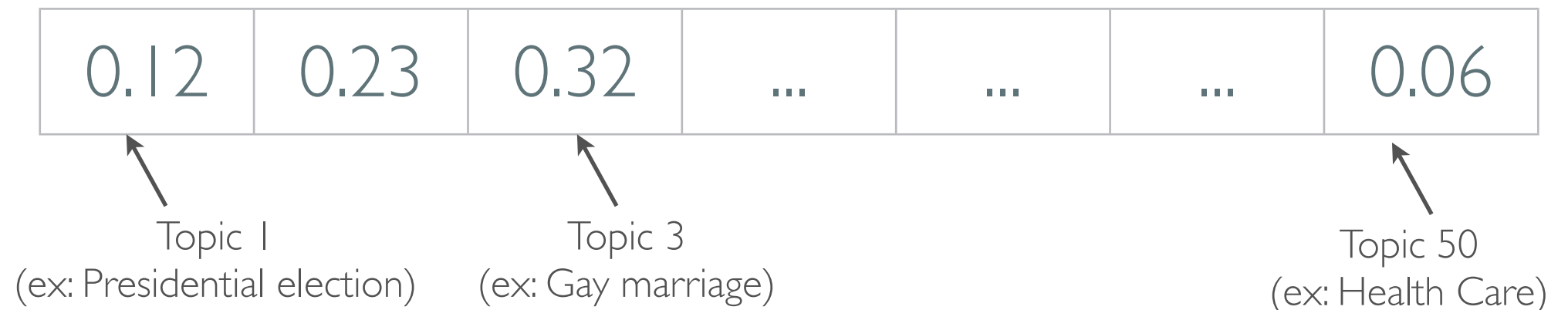
2. Finding diversity-seeking users

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**



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

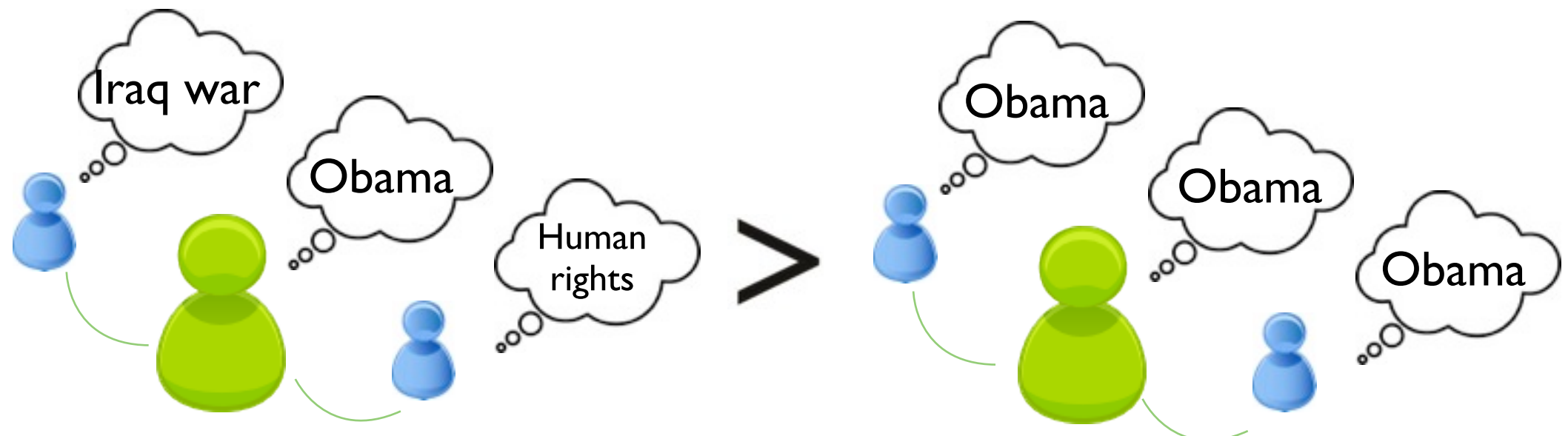
2. High variance of

topic similarity between the user and friends.

* $f(i)$: user i 's number of friends

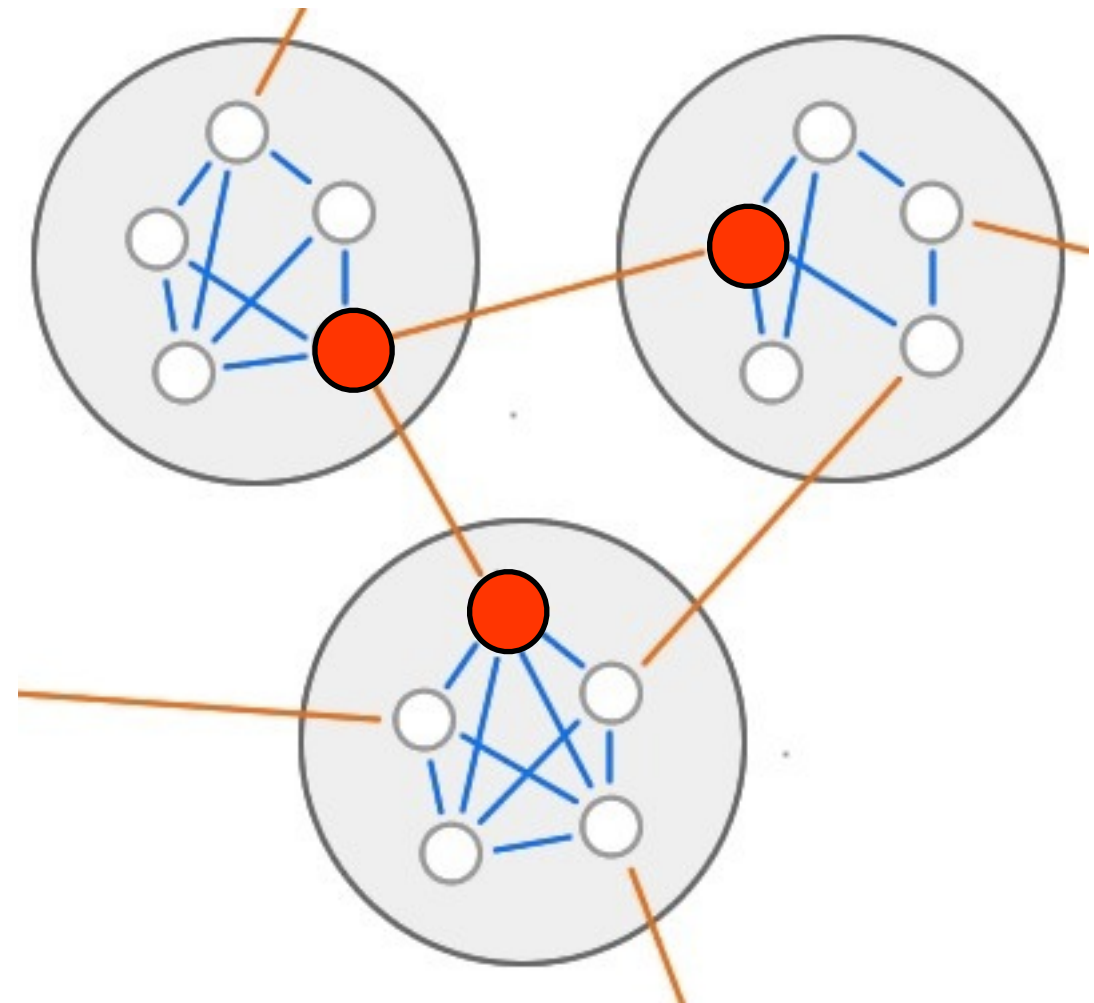
$TS(i,j)$: Cosine similarity between user i and j 's topic distribution

**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

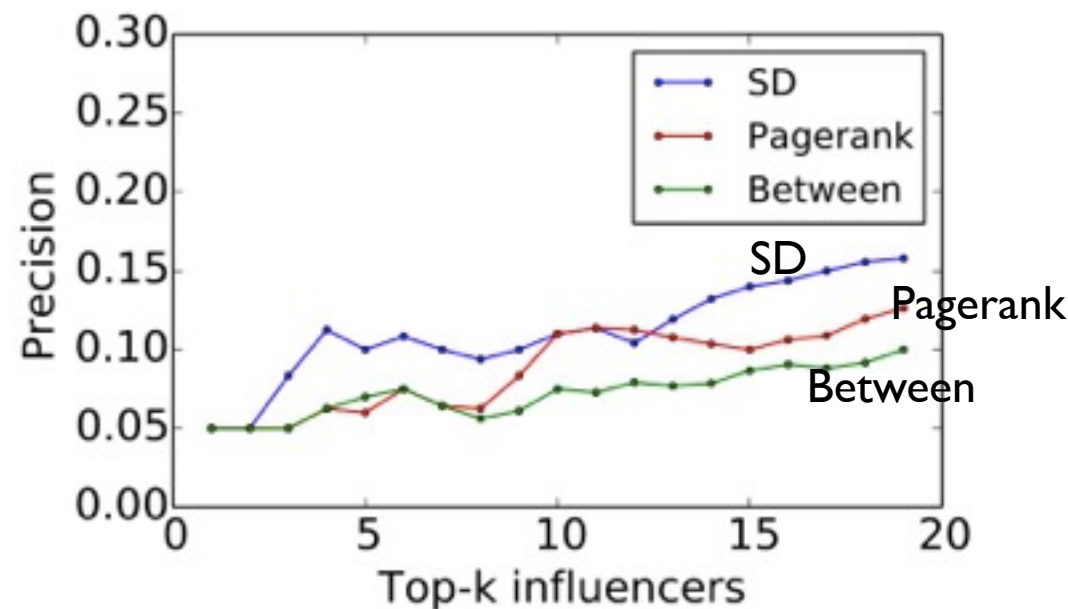
Experiment setup

- 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 be used to find structural hole spanners.



3. Finding structural hole spanners using Social Diversity

- Our 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!