

# Users Participation and Social Influence during Information Spreading on Twitter

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Online Social Networks generate a prodigious wealth of real-time information at an incessant rate. In this paper we analyze crawled data from Twitter, in order to describe the structure and information spreading dynamics of Online Social Networks. We propose a measure with three parameters to state the efforts of users on Twitter to get their information spreading, based on the unique mechanisms for information retransmission on Twitter. We notice that small fraction of users with special performance on participation can gain great influence, while most other users play a role as middleware during the information propagation. We further carried out a community analysis and found four different kinds of user participation that determine the information flow dynamics. These findings suggest that exiting topological measures[1, 2, 3, 4] alone reflect little about the influence of individuals and provide new insights for information spreading.

## References

- [1] Chen Y, Chen L, Sun X, et al. Coevolutionary dynamics of opinion propagation and social balance: The key role of small-worldness[J]. The European Physical Journal B, 2014, 87(3): 1-5.
- [2] Li Y, Qian M, Jin D, et al. Revealing the efficiency of information diffusion in online social networks of microblog[J]. Information Sciences, 2015, 293: 383-389.
- [3] Blondel V D, Guillaume J L, Lambiotte R, Fast unfolding of communities in large networks[J]. Journal of Statistical Mechanics Theory and Experiment, 2008, 30(2):155-168.
- [4] Li Y, Qian M, Jin D, et al. Revealing the efficiency of information diffusion in online social networks of microblog[J]. Information Sciences, 2015, 293: 383-389.

Table 1: Envelope fitting results of the relationship between retransmission(y) and parameters(x).

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Parameter	Functions
user enthusiasm	$y = axbex/c$ , $a = 29.5$ 0.81, $b = 0.42$ 0.023, $c = 10$
user engine	$y = ax b$ , $a = 2308.4$ 2.6, $b = 5.79$ 0.012
user duration	$y = ax b e x/c$ , $a = 4112.7$ 4.9, $b = 1.02$ 0.025, $c = 1000$

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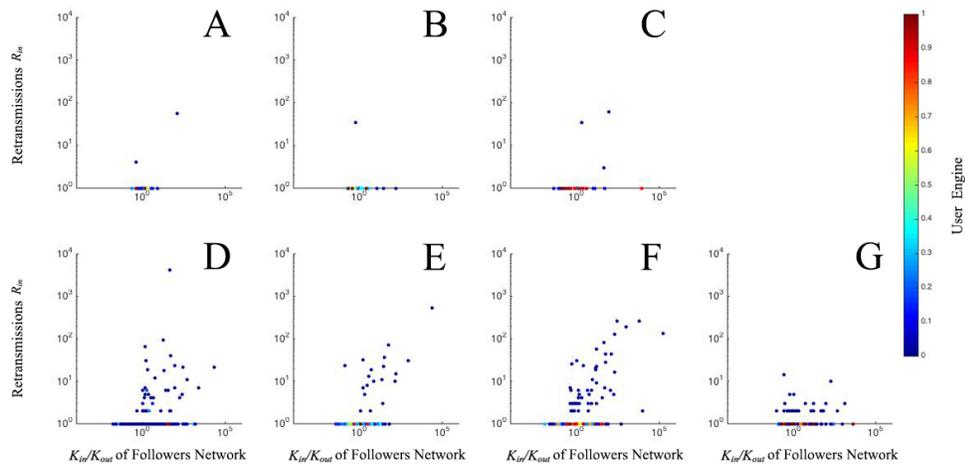


Figure1: The relationship between retransmissions and users in and out degree among seven collectivities

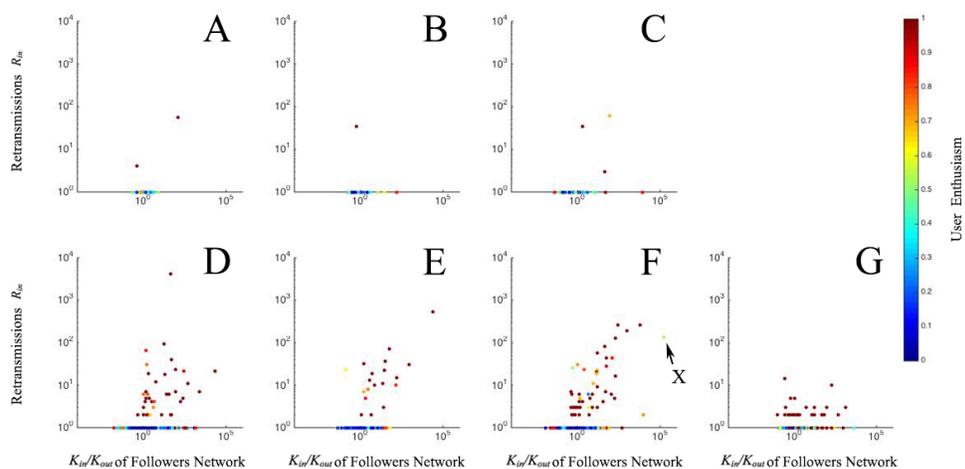


Figure2: The relationship between retransmissions and users in and out degree among seven collectivities

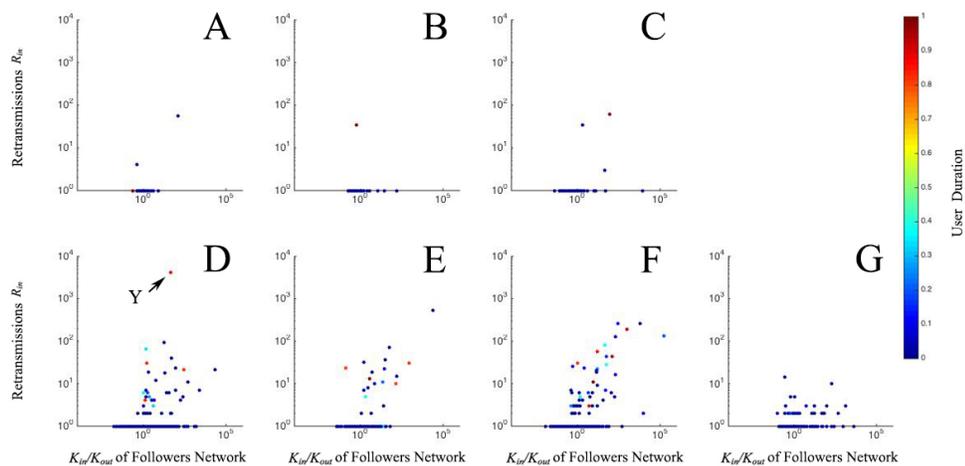


Figure3: The relationship between retransmissions and users in and out degree among seven collectivities