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# Information in social networks

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# What we research?

Information diffusion on social networks

# Why we research?

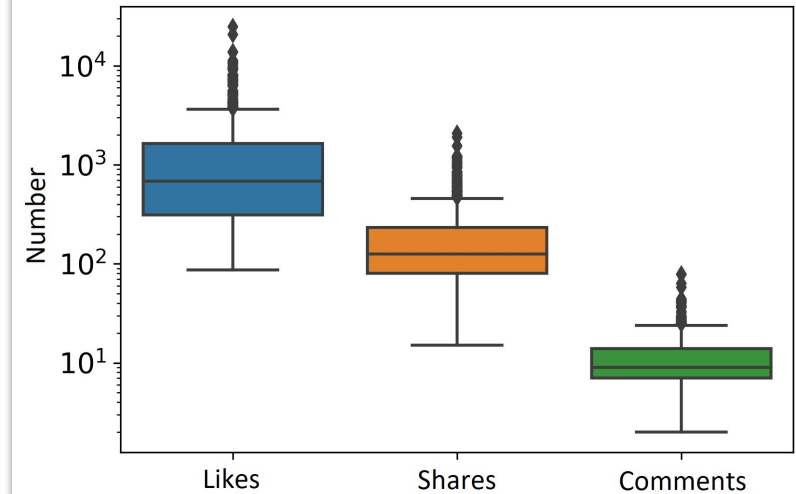
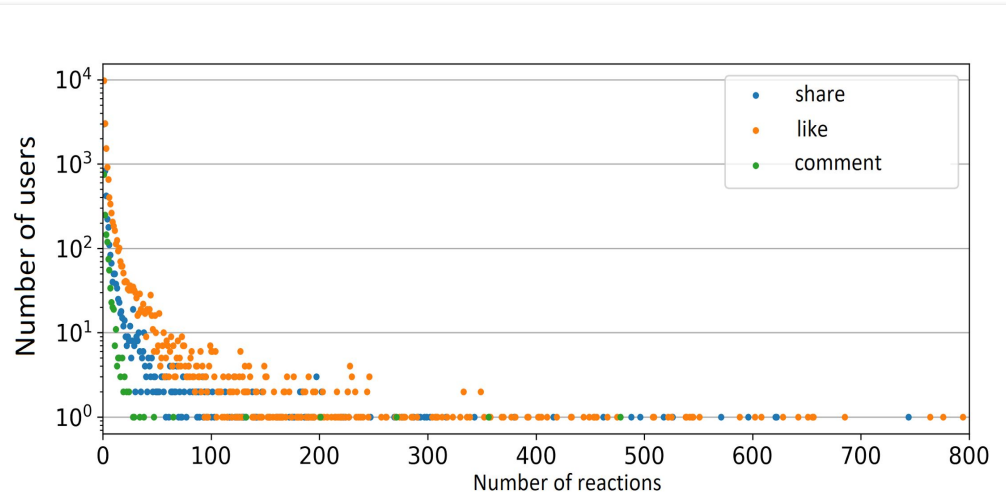
Information diffusion is crucial for:

- Businesses to promote products
- Governments to predict and regulate public opinion

# Dataset description

- Dataset was collected from VK social network
- 1 community
- ~294k followers and ~33.5m friends of followers
- Network consists of ~33.8m nodes and ~80.6m edges
- 805 posts during 508 days (06/27/2016 – 11/13/2017)

# Dataset description



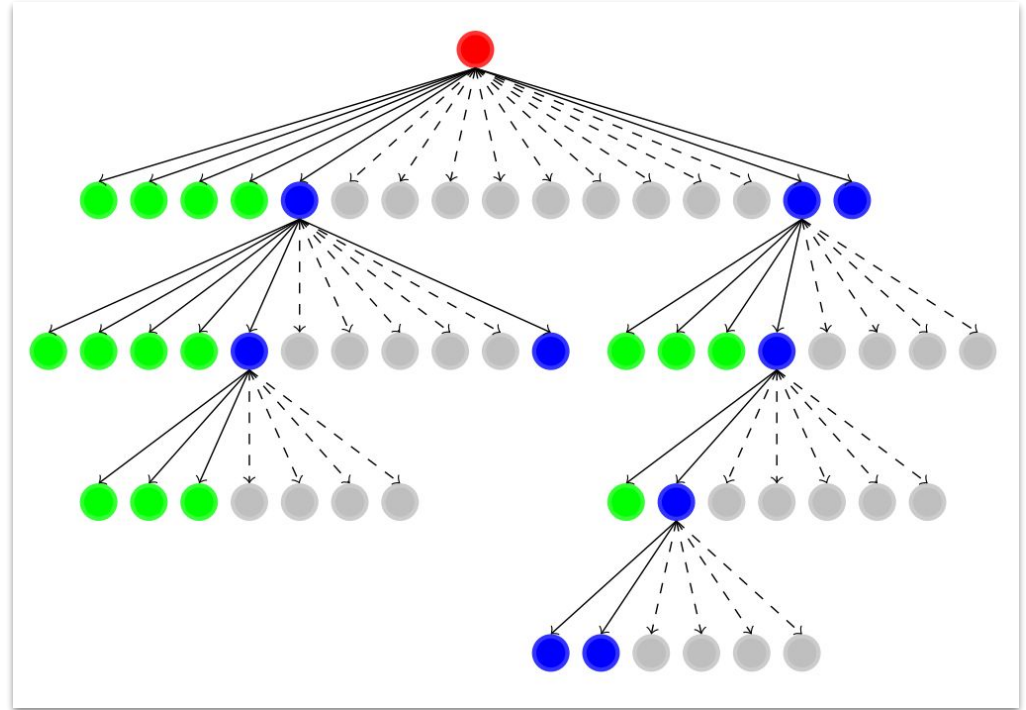
# Information cascade tree

Average path length:

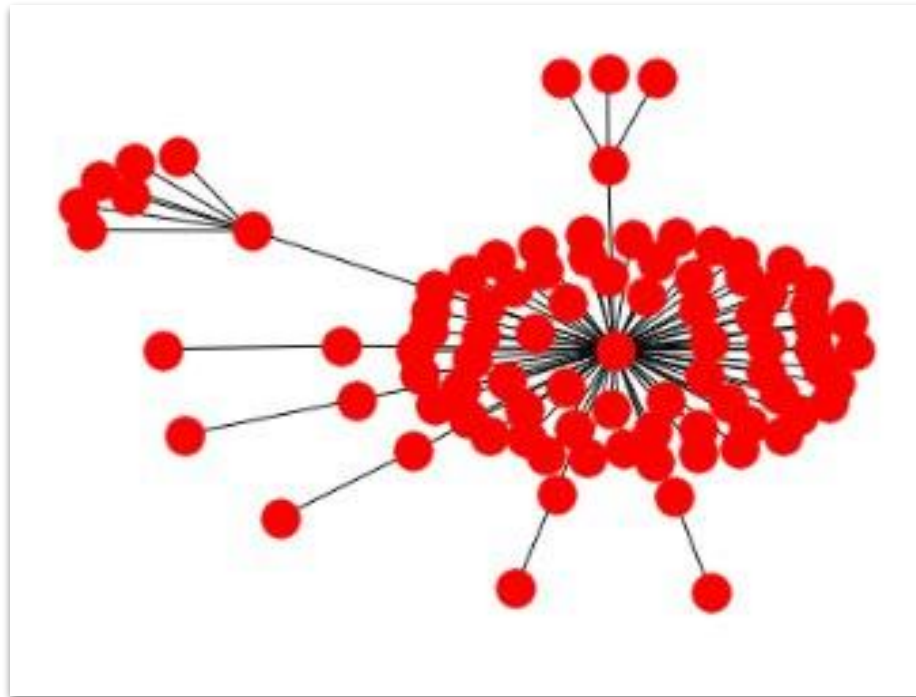
$$E[H] = \frac{1}{N \cdot (N - 1)} \sum_{i=1}^N \sum_{j=1, j \neq i}^N H_{ij}$$

Degree variance:

$$Var[D] = \frac{\sum_{i=1}^N (d_i - E[D])^2}{N}$$



# Cascade tree in dataset



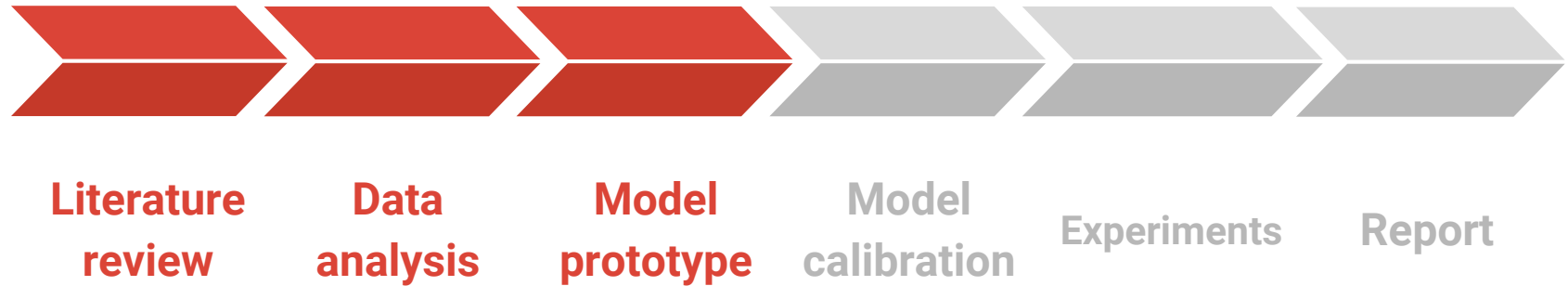
# Random Recursive Tree

- Tree starts with the root with  $index = 1$
- The probability that new node will connect to a node with  $index = i$  is proportional to the degree of this node of power  $\theta$ :

$$\frac{d_i^\theta(t)}{\sum_{i=1}^t d_i^\theta(t)}$$

RTT is defined by size  $N$  and scale parameter  $\theta$ .

# Research progress





# References

- A. Guille, H. Hacid, C. Favre, D.A. Zighed: Information diffusion in online social networks: A survey.
- L. Liu, B. Qu, B. Chen, H. Wang, A. Hanjalic: Modeling of Information Diffusion on Social Networks with Applications to WeChat.
- A. Rudas, B. Toth, B. Valko: Random trees and general branching processes.

# Thank you for attention!

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