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Theory of Networked Systems: Project Status

We will study applications for inferring the underlying network over which information, viruses, or influence propagate.

First, we will experiment with the NetInf algorithm as described in “Inferring networks of diffusion and influence.” We will apply it to three datasets, potentially modifying it or using map-reduce to improve speed (and analyzing the sacrifices of accuracy):

1. Memetracker: popular memes and how distinct phrases appear throughout a network. 343 million phrases and 8 million textual phrases that appear more than 10 times
2. Blog Hyperlink:  hyperlinks between blog posts as a way to represent flow of information. 172 million news articles and blog posts from 1 million sources over a period of a year.
3. Flickr: tracks how images are reposted by different users over time. Since images have the same metadata we can see how an image propagates through a network like a virus. We believe we can apply this to NetInf because it has many different cascade chains (sharing of individual images) and thus may be able to tell the underlying network structure.

Second, we will explore the feasibility of creating a system that would apply this cascade methodology to Twitter in order to create a marketing tool, and plan to run a sample experiment on real data and analyzing the results.

We will articulate how the methodology could be used to understand some of the underlying network topology of Twitter subnetworks using hashtags for specific products. For example, if a marketing team for the new Apple Watch could assemble sets of related items (#microsoftband, #applewatch,#fibit, #wearables, etc) and find the diffusion of these hashtags and their permutations through the network, they could better understand their audience’s network.

References:

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