ViralViz: Exploring Diffusion of Information in a Social Network

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Introduction

- Social Media Managers/Analysts are always asking...
  1. What topics are people talking about?
  2. How does the conversation about a particular topic change over time?

- They are interested in...
  1. studying topic diffusion in social networks in order to understand what factors contribute to viral phenomenon

If only there were a solution...but wait!
Goal: To develop an application to complement NodeXL, capable of analyzing content diffusion through a social network

Approach:
- Read in GraphML formatted data (e.g. from NodeXL)
- Create visualizations to present the temporal aspect of communications (Streamgraph)
- Provide tools to analyze this data
Streamgraph

• Design inspired by Edward Tufte’s macro/micro principle - to show many individual time series while also conveying their sum

• Represent message activity within the social network over time

• Organize messages into topics, each represented by a stream layer
Implementation & Demo
Implementation & Demo

ViralViz: Visualizing Temporal Content Flow in Social Networks

Visualization Panel
Implementation & Demo

ViralViz: Visualizing Temporal Content Flow in Social Networks

Details Panel
Implementation & Demo

Control Panel

ViralViz: Visualizing Temporal Content Flow in Social Networks

- (1) Load Dataset
- (2) Filter Data
  - Desired Topics In Stream:
  - Granularity:
  - Clustering Method:
    - Latent Dirichlet Allocation
  - Exclude terms (into a disk):
    - social good
    - global
- (3) Explore Stream
- (4) Workspace Options

#SocialGood Topic Stream

Topics ranked by Visibility

Top Users, Number of Tweets

Stream Legend

ViralViz
Implementation & Demo

Demonstration
The big jump in conversation about big data may possibly be explained by the fact that OpenStack Summit, a conference discussing the future of cloud computing, occurred Nov. 5-8, 2013.

The most active Twitter account was The Big Blue Puppet (@bigpupazzoblu), a bot that retweets messages on the topic of “Big Data”
Usability Testing

- $n = 10$; composed of expert and non-expert subjects
- Asked to perform three tasks via the onboarding interface:
  - Task 1: Load Data & Explore Display
  - Task 2: Load Data, Filter Data, and Explore Display
  - Task 3: Load Data, Filter Data, Explore Display, Annotate, and Export Results.
- Pre and post activity questionnaires.
Task 3: Use all the features of ViralViz to explore the BigData.xml dataset.

Task Difficulty

Satisfaction with Results
Critique of individual features:

Annotations

Data Granularity

Layout Ordering

Topic Filtering
Future Work

• Explore other temporal topic models
• Include support for more details on demand (tweet viewer)
• Increase support for dynamic browser sizes
• Add visual cues to highlight the zoom & slide feature (timeline)
• Increase support for annotations with more prolific representation in Streamgraph
• Provide access to influential communications and key users
• Access to larger Twitter datasets
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Questions?