SCTG: Social Communications Temporal Graph –A novel approach to visualize temporal communication graphs from social data

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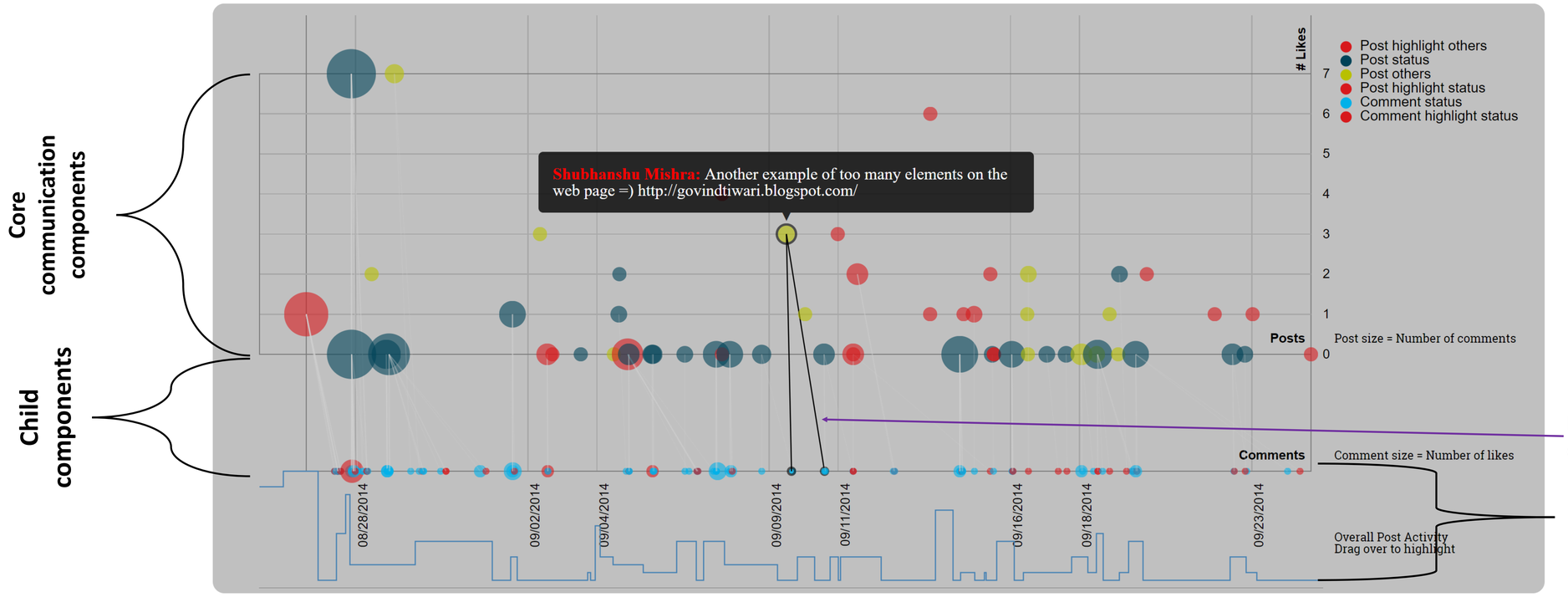

SCTG is a web based visualization which builds on the visualization principles of –overview, zoom, filter, details-on-demand, relate, history, and extracts (Shneiderman 1996).

Shneiderman, B. 1996. "The Eyes Have It: A Task by Data Type Taxonomy for Information visualizations." Proceedings 1996 IEEE Symposium on Visual Languages. IEEE Comput. Soc. Press, 336–43. doi:10.1109/VL.1996.545307.

SCTG has also been successfully applied to visualize sentiment of tweets and it's users as part of the SAIL project (Mishra et al. 2015).

Mishra, Shubhanshu, Jana Diesner, Jason Byrne, and Elizabeth Surbeck. 2015. "Sentiment Analysis with Incremental Human-in-the-Loop Learning and Lexical Resource Customization." In Proceedings of the 26th ACM Conference on Hypertext & Social Media, 323–25. doi:10.1145/2700171.2791022.

A working demo can be viewed at: http://shubhanshu.com/social-comm-temporal-graph/

Motivation

Communication on social channels such as social media websites, email, forums, and groups; follows an inherent temporal network structure. Herein, each communication e.g. a post, occurs at a specific point in time, which can be extracted from its metadata. Furthermore, each communication is also linked to a creator e.g. a user, organization, topic, or another communication—which created the communication. Finally, the communication items can be tagged with additional numeric metadata which can be used to score some attributes about the communication e.g. number of comments, retweets, or shares. Existing timeline or network visualizations are not able to do justice to the temporal network structure of such communications. SCTG is aimed at highlighting the temporal communication nature of social communication channels while allowing various meta-data attributes to be shown alongside.

Visualization components and usage

1. **Core communication components:** This can be a user in a feed or a specific post
2. **Child components:** This can be associated posts by a user or comments to a post
3. **Component links:** Core communication is liked to its children
4. **Activity timeline:** This quantifies the temporal activity measurement
5. **Tool tips:** They provide additional data about each component
6. **Component heights, scaling, and color:** Visualize additional metadata.

Application use-cases

1. **Facebook group data:** Each post in the group feed is a core component, each comment is its children. Posts colored based on content type (e.g. links, text, videos, etc.), scaling based on number of likes.
2. **Twitter data with sentiment:** Each user is a core component, each tweet are its children. Tweets can be colored based on sentiment labels, scaled based on retweet counts, and user's scaled based on number of followers [see demo]
3. **Email data:** Each email is core component, replies are children. Post colored based on email folder, scaling based on number of participants.

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