

Visualizing Emotion and Influence in Twitter

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How does emotion in social media
relate to information flow?

Are emotional tweets more impactful?

Which Twitter users shape public opinion?

Motivation

Researchers across many fields including business and marketing, journalism, and the social sciences are **using Twitter and other social media to generate insight** about public opinion, current events, and communication.

Like other kinds of human communication, **tweets carry sentiment**, emotion, and affect. Many believe that this aspect of social media **plays a major role in shaping information networks** like Twitter, but the specifics are not yet well understood.

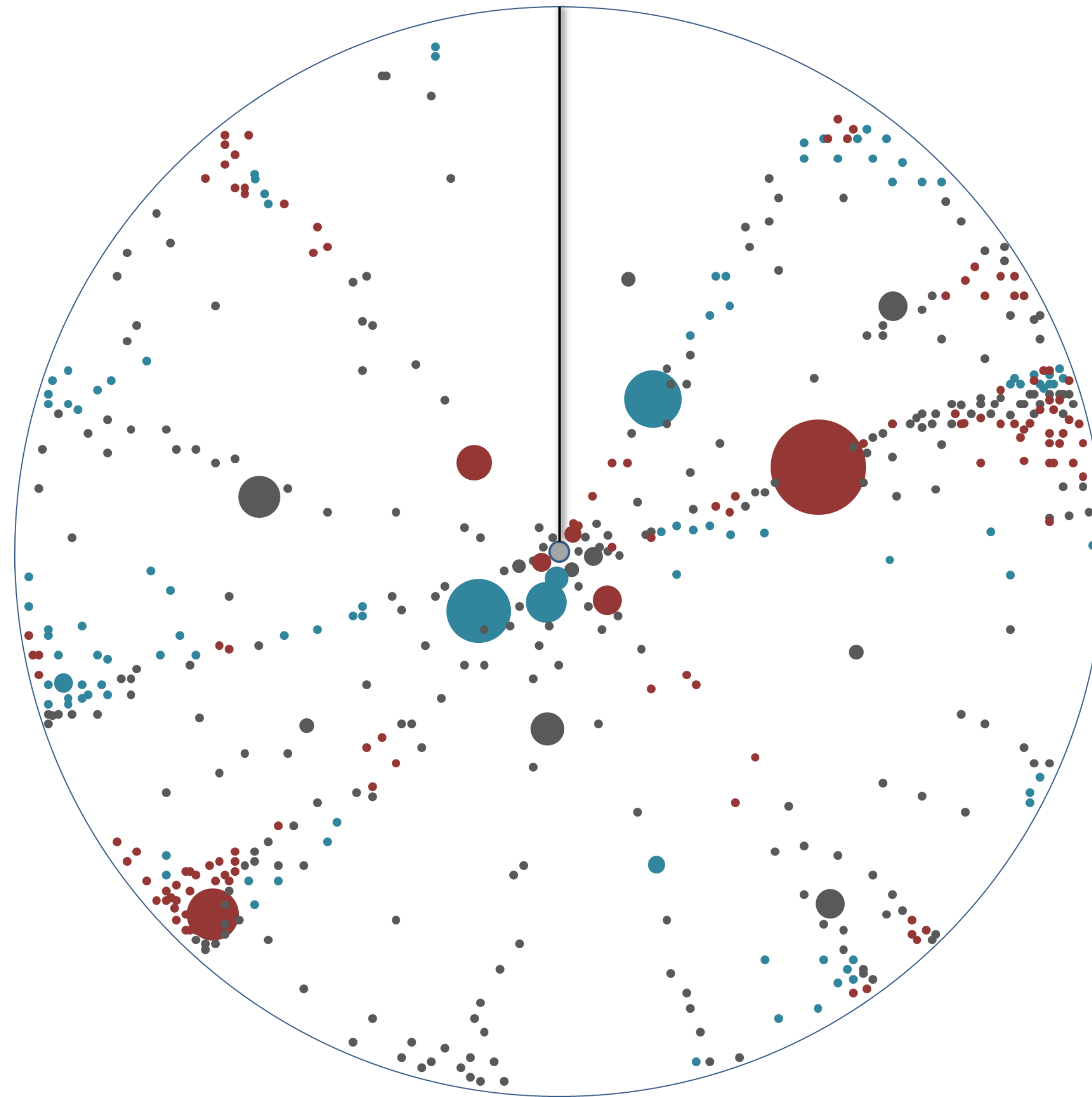
Twitter collects and broadcasts the thoughts of millions of users from around the world, generating over 340 million 140-character messages per day. This enormous volume **defies traditional methods of analysis**.

Visualization can help make sense of the role of emotion in social media. In this project, we are developing visualizations that help **explain the emotional impact of individual tweets** and how this **propagates through the network**.

Research Contributions

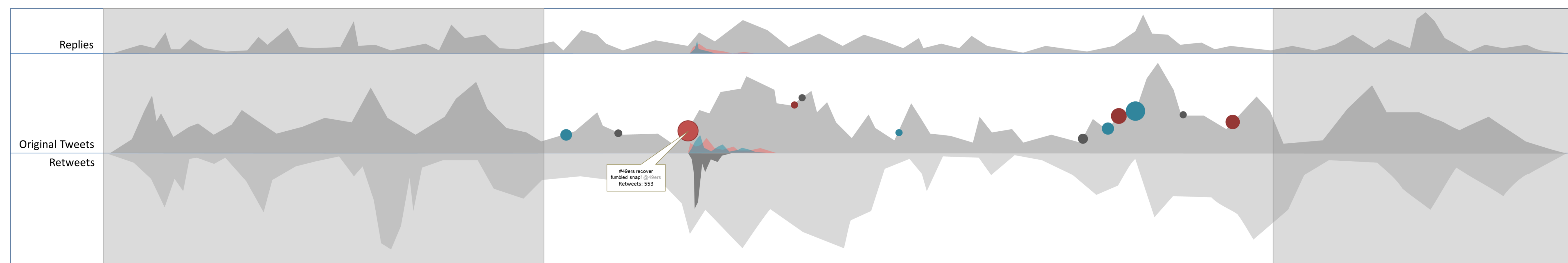
The complexity of social media data make designing effective visualizations challenging. Our work studies possible solutions to several specific visualization problems:

- Explain **change over time** by focusing on anomalies and inflection points.
- Explore network phenomena like **influence and impact** by displaying intuitive quantities rather than complex metrics.
- Acknowledge **uncertainty and error** by exposing results from multiple sentiment classifiers.
- Manage **enormous network size** by emphasizing key users and tweets.



Proposed Visualization. Time wraps around the center, counter-clockwise. Prolific users are close to the center, infrequent tweeters at the outside. Point size shows number of retweets and replies. Color indicates sentiment.

Proposed Visualization. Volume of tweets, retweets, and replies over time. A region of the timeline is selected. Tweets with many retweets or replies are highlighted. Tweets responding to the selected tweet are separated from gray regions, colored by sentiment.



Research Plan

Determine usefulness and importance of visualization of sentiment. We will run a between-subjects laboratory study. Compare the full visualization (with sentiment layer) to a version with sentiment visualization removed.

Target Users

Researchers studying Twitter. Includes academic researchers, journalists, and business and marketing analysts.

Sensemaking Task

Participants use the visualizations for semi-structured exploration of how emotion affects Twitter communication.

Participants prompted to discover key people and tweets and record these on note cards. At the same time, participants draw connections and relationships, piecing together a story from the visualization.

Exploratory task is scaffolded by an introductory task with multiple choice answers that demonstrate the expected scope of responses. The questions *Who*, *What*, *When*, *Why*, and *How* will structure the information participants seek and record.

Evaluation

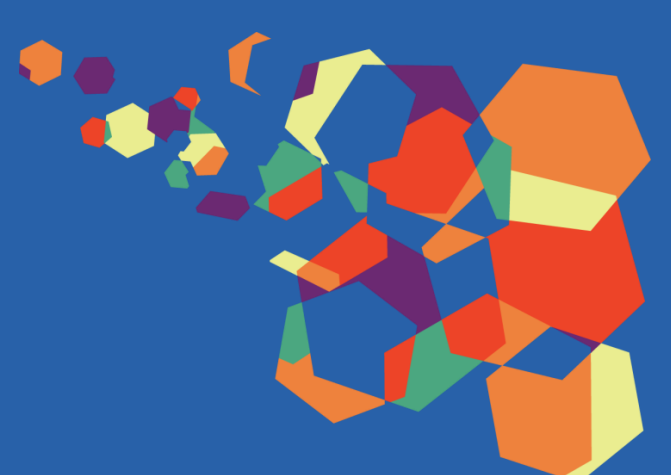
Examine notes produced by the participants, considering number of important users and tweets identified and number and complexity of relationships developed. In addition to quantitative analysis, convert the cards into narrative stories for qualitative analysis.

Hypothesis

Visualization of sentiment will help participants locate influential users and tweets, and will improve understanding of how and why events in the Twitter stream take place.

We expect to see more complex, richer stories with more compelling explanations from the group using visualizations with sentiment.

For more information, contact Michael Brooks at mjbrooks@uw.edu or Cecilia Aragon at aragon@uw.edu or visit <http://depts.washington.edu/sccl>



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