

# Friend Bubbles: Personal Visualization for Facebook

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## ABSTRACT

Hundreds of millions of people use social networking sites like Facebook every day to maintain awareness of their friends. To aid this, Facebook presents people's activities by focusing on current or recent events and provides long lists that sequence individual stories. However, methods that support exploration of past personal activities in aggregate are missing. In this paper we present Friend Bubbles, a new personal visualization that allows Facebook users to explore who among their friends is engaging with the content they post and what this engagement reveals about their social ecology. We consider three types of engagement on Facebook: likes, comments, and shares. Friend Bubbles presents the user with two collections of bubbles: (1) representing posts they have made on their own timeline such as status updates, photo and video uploads, and links; and (2) representing their friends who have engaged with those posts. Selecting any bubble in either collection reorders the visualization to show similarities and engagement relationships between posts and friends. We discuss the contributions and role of Friend Bubbles, a new personal visualization that helps users to understand their personal social ecology on Facebook and to explore engagement with their content.

**Keywords:** Social networks, Facebook, personal visualization.

**Index Terms:** Information systems~Social networks, Human-centered computing~Visual analytics, Human-centered computing~Information visualization, Human-centered computing~Social tagging systems

## 1 INTRODUCTION

Today, people from everywhere in the world use social networking sites (SNSs) to communicate with each other by posting and reading content such as status updates, photos, videos, and web links. Often, this content is shared with a broad audience that may consist of close friends, family members, acquaintances, and even strangers. We primarily focus on Facebook due to its popularity and ubiquity on a global scale. Content driven communication, or as we call it engagement, is conducted over three primary channels on Facebook: likes, comments, and shares. Our questions are: how can we visualize our friends' engagements with our own posts? can such a visualization reveal hidden patterns or insights? and will this augment casual Facebook users' experience with their personal social network?

In this paper, we introduce Friend Bubbles, a personal visualization work in progress that uses the like, comment, and share data from an individual's Facebook profile and their posts.

Facebook has been heavily studied since its launch in 2004. Researchers have focused on many different aspects of the social networking site such as statistical graph analysis, privacy controls,

user perceptions, and visualization of social network data [2].

Social networks are naturally visualized with node-link diagrams but these representations are often cluttered by the sheer density of the edges connecting large dense clusters. Categorizing nodes and their relationships, either explicitly with user interaction or through analysis of the graph structure, creates an ontological view of the network that can reduce clutter and allow the user to understand the social graph more quickly and precisely.

Vizster is an egocentric visualization that shows the structure of an individual's online social network and provides tools that highlight independent sub-groups with different levels of granularity. Vizster makes these sub-group distinctions algorithmically from the graph structure of the network and does not consider engagement or friendship strength between individuals [4].

Based on a Facebook usability survey, Melhuish et al. reports that the majority of respondents found less than 25% of items on the News Feed to be interesting; photo stories being the most interesting, followed by stories about new friends they don't know well but see regularly in real life [5]. Melhuish et al. proposed an egocentric news feed that organizes friends in concentric circles: close friends near the center and distant friends further away.

SmallWorlds is a recommendation engine that uses the Facebook API to visualize a user's item preferences (such as music, movies, etc.), friends with similar preferences, and new item recommendations based on these friends [3]. SmallWorlds uses a partial order graph divided into several regions in a vertical or concentric circular layout. Users can spatially drag friends to change the node weights and the resulting recommendations, for example to increase their affinity and preference to a specific friend's tastes.

Sharing and re-sharing of content is one of the most used and notable features of a SNS, spreading information quickly between largely disconnected groups of people [1]. Google+ Ripples visualizes the information flow of content on the Google+ SNS by visualizing the share/re-share tree as embedded circles [6]. People with large online audiences who are the impetus for content being re-shared many times by their subscribers are represented with large circles to show that all of the re-share activity is embedded inside their circle. This size encoding gives viewers a quick overview of who is a large social influencer.

## 2 FRIEND BUBBLES

The goal of Friend Bubbles is to give additional insight to the user of their personal social network that they may not discover by using the Facebook interface alone. This includes showing the user how their social network is organized into different sub-groups and cliques, who is engaging with their posted content, how these friends are similar to each other, and the chronological history of various friendships.

Friend Bubbles is a web browser based visualization that shows the user an at-a-glance overview of their posts and friends. Both posts and friends are organized by a force directed layout that groups similar items together. This overview layout doesn't hide or obscure any posts or friends; though currently a small dataset is used that only includes photo posts. Both pods of

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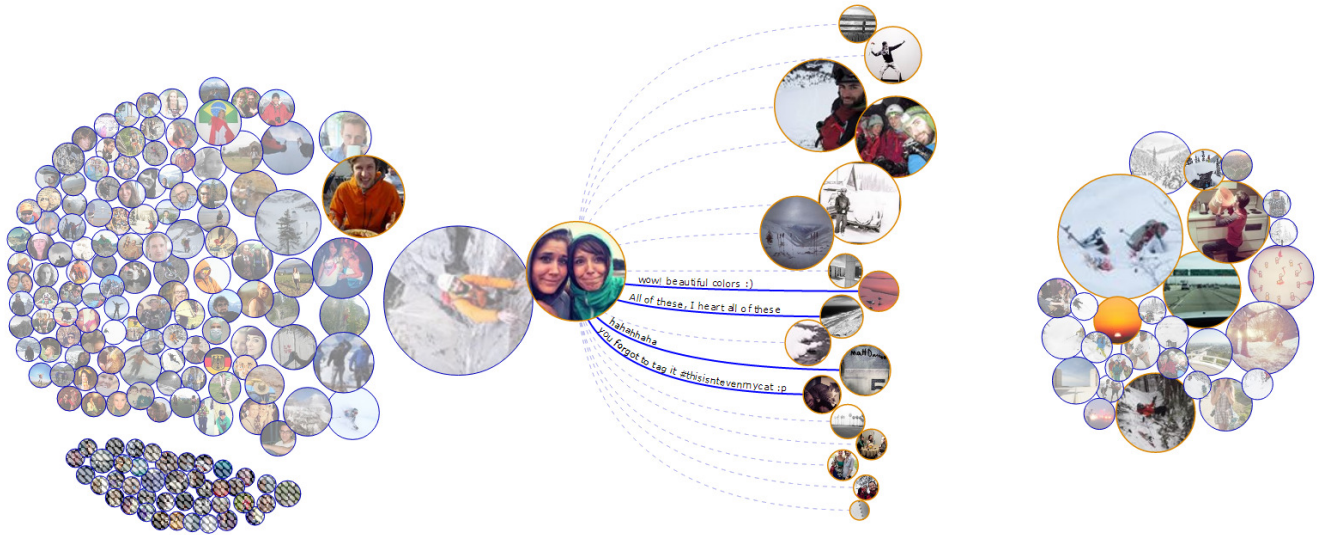


Figure 1: Friend Bubbles visualization: (a) Facebook posts on right; (b) friends on left; (c) a selected friend (green jacket); and (d) the posts that she engaged with (through likes and comments) arranged vertically.

bubbles gently move and flow past one another to draw the user's attention to the visualization (Figure 1a, 1b).

The amount of engagement that a post receives or that a friend gives is encoded using the size of the bubble, giving the viewer a clear understanding of which posts are popular and who is engaging with their content the most. When the user hovers their mouse pointer over a bubble, it becomes highlighted and begins to oscillate slightly, as do all other bubbles associated with it, i.e. all posts that a friend has engaged with. This allows the viewer to identify how friends and posts are related by quickly hovering with the mouse.

A bubble that is clicked moves to the center of the visualization (Figure 1c). Curved *engagement* links that represent *likes* or *comments* tie the selection to its associated bubbles. The associated bubbles move towards the center of the visualization and are ordered vertically by different criteria (popularity, posting time, friendship length). The type of *engagement* link is represented by a curved line connecting both bubbles. Lightly dashed lines represent *likes* while heavier solid lines represent *comments* and include the comment text along the line path. In Figure 1c and 1d, a friend bubble is selected and the curved paths show what posts she engaged with. The layout would be reversed if a post bubble was selected, showing a group of friends arranged vertically instead.

One of the main goals of this tool is to give the user insights into the finer subdivision of their friends and posts. Friend Bubbles groups bubbles together to show what friends and posts are "similar" to one another. In Figure 1c, the selected friend (green jacket) has another friend (orange jacket) hovering near her because they share the same tastes and engage with the same kinds of posts. The bubbles on the very left represent people who are dissimilar to the selected friend in terms of what posts they engage with. This type of grouping and clustering is unique to Friend Bubbles. Other tools or visualizations infer the affinity of two people based on social graph edges such as the number of mutual friends or the dense clustering of social groups. Friend Bubbles primarily considers the *engagement* of these actors to determine friendship affinity.

### 3 CONCLUSION

In this paper, we present Friend Bubbles, a personal visualization that allows Facebook users to explore how their friends engage with their posts and how various sub-groups are organized inside of their social network as a whole. The Friend Bubbles layout considers *engagements* that are being used to indirectly curate an individual's posts and may help to reveal complex relationships between particular friends or groups of people.

Friend Bubbles is currently a prototype. For example, displaying a larger dataset may require posts to be clustered together by their type (status updates, photo albums, etc) or to allow filtering or search options. A chronological timeline history of a friendship could reveal interesting behaviors among between certain individuals, for example those that have fallen out of touch with each other. Finally, customization options could be carefully considered that allow the user to organize the layout as they wish.

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