
TweetSpiration: leveraging social media for design inspiration

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Abstract

We present TweetSpiration, a Web-based application that leverages social media to inspire new search directions on the Web. TweetSpiration can be used at any time, but it is particularly beneficial when designers have difficulty developing new search terms or are looking for new search directions. By visualizing socially derived word associations, designers may develop new search directions based on *others* comments or thoughts on the search topic. In an initial study, users reported that TweetSpiration helps develop new search directions and provides new perspectives on the design problem.

Keywords

Creativity, Web search, inspiration, examples, design

ACM Classification Keywords

H.3.3 [Information Storage and Retrieval]: Information Search and Retrieval --- Search process, Selection process; H.5.2 [User Interfaces]: Information and Presentation --- User-centered design.

General Terms

Design, Human Factors

Introduction

Designers in many domains such as graphic, Web and industrial design rely on the Web in the early phases of

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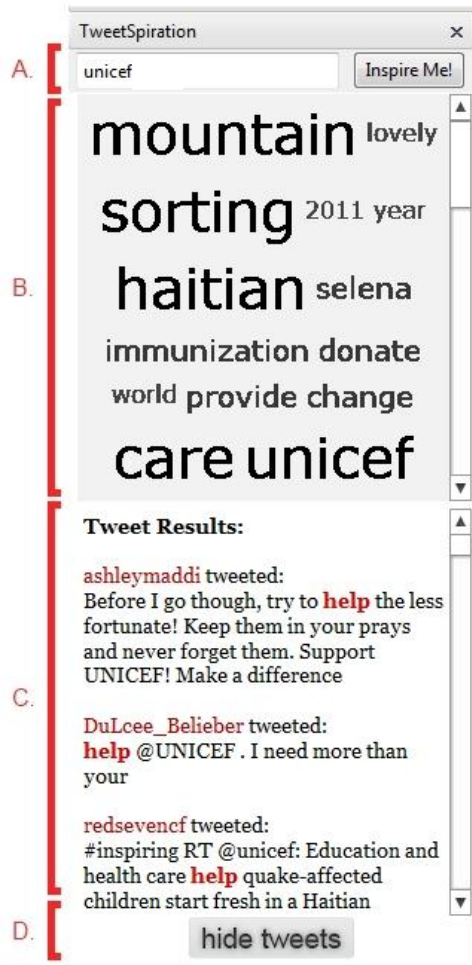


Figure 1: The TweetSpiration application includes (A) an inspiration box, (B) a word cloud visualization, (C) a list of tweets related to a user-entered term and (D) an option to hide the tweets.

design to learn about the design problem, identify existing solutions, and find inspiration for new design directions [4, 7, 8]. They have stated that the ‘randomness’ and resourcefulness of the Web allows them to make more connections and draw more inspiration than traditional sources like books and magazines [2]. However, there are two main issues designers have identified when using the Web for inspirational searching: it is either too random providing too many irrelevant sources or too specific not allowing for the discovery of inspirational content [6].

One of the causes of designers search difficulties is the sheer amount of information available on the Web. Search engines return hundreds, if not thousands of Webpages per query. With the ever increasing amount of information available, it is becoming more and more difficult for designers to parse through the information to locate design inspiration and develop new search directions. To compound this issue, the goal of most search engines is to return highly specific and ordered results making designers privy to the artifacts directly related to their search term reducing their chance to find inspirational content [1, 2]. In addition, after many search sessions, designers may become fixated on a particular topic and struggle to develop new search and design directions.

One way to help designers develop these new search directions is to leverage social media as it has been identified as an excellent tool for online content filtering [3]. One of the most popular social media applications is Twitter, a microblogging service that allows users to post messages (tweets) up to 140 characters long to discuss ‘what’s happening’. Twitter allows for content

filtering by providing a search API which allows access to all public ‘tweets’. Since there over 600 tweets sent every second, the Twitter API provides access to up-to-date information on the search topic. By properly displaying the content retrieved from this search, we can provide designers with an overview of what *others* are currently discussing about a topic to inspire new search directions. This would particularly be of value to designers when they have become mentally stuck during a search session and need a new perspective on the design problem.

In this paper, we introduce TweetSpiration, a Web-based tool that displays filtered tweet results and socially derived word associations based on a user-entered term. By filtering Twitter content, designers can gain a new perspective of the design problem which can lead to new search directions, directions they may not have thought of without our tool. Here we describe the design and implementation of our tool as well as a user study conducted with our prototype.

TweetSpiration Interface

TweetSpiration was developed to inspire new search directions on the Web in an effort to aid designers in developing new design ideas. The application consists of four primary components: (A) an inspiration box, (B) a word cloud, (C) a list of tweets and (D) an option to hide the tweets, see Figure 1.

TweetSpiration can be used at any time, but it is particularly beneficial when designers have difficulty developing new search terms or are looking for new search directions. To use TweetSpiration, users simply enter a term in the inspiration box and select the ‘inspire me’ button. This action prompts a Twitter

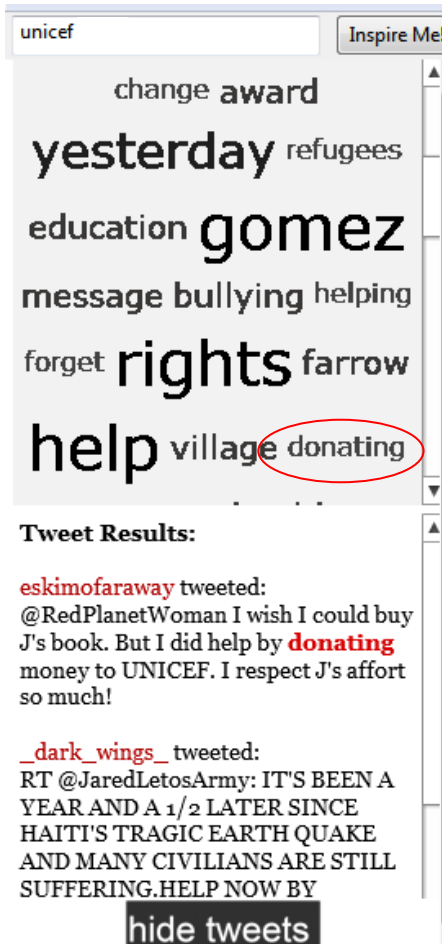


Figure 2: Users can select terms (e.g. donating) in the word cloud to filter the Tweet Results below. The Tweet Result section then contains only tweets with the selected term (appearing in red).

search and displays the 150 most recent tweets containing the term in the Tweet Results section. A word cloud also visualizes the frequency of words appearing in these tweets. This in effect filters Twitter to give users a visual summary of words other people associate with the search term, words the user may not have thought of on their own. To understand how and why this association was developed, terms in the word cloud can be selected (by clicking on them) to filter the tweet list below to contain only the tweets with the selected term, see Figure 2. The filtered tweets have the selected term highlighted with red font. Users can also select the 'hide tweets' button which removes the tweet list and dedicates the entire sidebar to the word cloud, see Figure 3.

For example, say a designer is developing a new advertisement campaign for UNICEF. They start by searching the Web for 'UNICEF' but struggle to find useful information and they find it difficult to develop new search terms. So, they launch TweetSpiration and type 'UNICEF' into the inspiration box, see Figure 1. Immediately, the user gains an overview of the topic and quickly deciphers the most frequent socially derived word associations including 'mountain, sorting, Haitian, and care' based on their size in the word cloud. The user becomes interested in why 'Haitian' appeared so they select the term and see in the filtered Tweet Results that UNICEF is helping earthquake victims in Haiti. They were also interested why 'Selena' appeared and why it was so small in the word cloud so they select the term and quickly find that Selena Gomez volunteers with the UNICEF foundation and Twitter Users are nominating her for a Shorty Award. The user has now developed two new search directions,

directions they had not developed prior to using the application.

This example above highlights some of the important uses of TweetSpiration. First, it provides users with an immediate overview of what Twitter users are discussing about their entered terms. In addition, it allows users to quickly associate these words with their entered term by filtering the tweet results below. This helps users understand *why* these words appear in the word cloud. Finally, because the application highlights the frequency of the words in the Twitter messages, users are able to see both highly visible associations (UNICEF helping Haitian children) as well as those items that are less known (Selena Gomez is working with UNICEF). The visualization of these associations spawns inspiration by identifying potential search paths.

The application itself is built in Java and uses the Twitter4J library to search Twitter using user specified terms. When a session is initiated by the user, the application retrieves the 150 most recent tweets containing those terms and then parses them to calculate word frequencies of the retrieved tweets using ActionScript. The retrieved tweets and word frequencies are then displayed to users by means of an Adobe Flash-based visualization.

A word cloud was chosen to visualize word frequencies in TweetSpiration because of its ability to highlight the most significant concepts and hidden relationships in the underlying content [5]. In addition, the popularity of word clouds for navigation and visualization purposes meant our users would likely find the visualization easy to understand and use. We included potential end-users



Figure 3: A view of TweetSpiration when the Tweet results have been hidden by selecting the 'hide tweets' option'

in our design process to select font sizes that most appropriately indicated tweet-word frequencies. Through this iterative process, we found the optimal combination to be four font sizes (17, 20, 33 and 38 pt) that represent four word frequencies ranges (<3, 4-9, 10-15, >15).

Preliminary User Study

A preliminary study of TweetSpiration was conducted in order to test the utility of the application for inspiring new search directions on the Web. The study consisted of a design task, a semi-structured interview and a post-study questionnaire.

Method and Procedure

Eight volunteers (3 female) between the ages of 21 and 28 were recruited from the University of Illinois student body to participate in this study. None of the subjects had heard of or used TweetSpiration prior to experimentation. The study began with a design task in which participant were asked to design a poster campaign for UNICEF USA on the University of Illinois campus that promoted donations. Participants were instructed that the goal of the task was not to generate polished solutions, but to search the Web for examples (from any Web source desired) and to generate initial solutions. In other words, they were asked to brainstorm ideas that could lead to new solutions and display the ideas in the form of lists, sketches, notes, keywords and other formats.

Participants were given 20 minutes to search the Web for design inspiration and develop solutions to the problem using whatever strategy they desired. After the time had expired, the experimenters interrupted the participants and introduced TweetSpiration. At this

time, its functionality was described and an example was given. Participants were then instructed to continue the task for 20 more minutes and encouraged to use TweetSpiration whenever they desired. Following task completion, a semi-structured interview was conducted to gauge participants search strategies and their opinion on the utility of TweetSpiration. Finally, a survey was completed by participants on the usability and utility of TweetSpiration.

Results and Discussion

All of our participants started the task by searching the Web for UNICEF and visiting the unicef.com Webpage. Participant 7 described their initial search strategy, "I started on Google and I searched UNICEF. The first result was the official UNICEF page, so I clicked on that and looked around the first page a little and looked at some of the sections. One of the first things I saw was kids in a Yemen school." All of our participants ideas centered on this same topic, UNICEF and kids, and it wasn't until they started using the TweetSpiration tool that they started to develop diverging ideas.

When introduced to the TweetSpiration tool, every user launched 'inspirational' searches based on UNICEF, like UNICEF kids, UNICEF help, and UNICEF Donation. When asked why or for what purposes, they used TweetSpiration Participant 3 responded, "I saw it as an associative device. The first thing I searched for was UNICEF; I clicked around to see what people were tweeting about with these terms. A couple interesting things showed up like 'snowflake'. It was pretty small, but I wanted to see what it was so I clicked on it. There is a UNICEF snowflake apparently. I'm not quite sure what it is but I thought it might be a nice picture for the poster." This quote displays an important concept,

	Ease of Learning	Ease of Use	Generated a lot of keywords	Generated useful keywords	Generated keywords I wouldn't have thought of on my own
Average	4.6	4.8	4.4	4.1	4.4
St. Dev.	0.5	0.5	0.5	0.6	0.7
Mode	5	5	4	4	5

Figure 4: The average, standard deviation and mode for our post-study questionnaire based on a five point likert scale from 1, strongly disagree to 5, strongly agree.

our users were not only interested in the highly associated content, but also those that appeared less frequently.

In addition to helping designers find information for their poster campaigns, TweetSpiration also helped our participants develop new search directions. Participant 1 explains, "I found a really big connection using TweetSpiration. I saw 'Lionel Messi' appeared in the word cloud when I searched for 'UNICEF' which led me to search the Web. I found out that Barcelona's entire team is supporting UNICEF by wearing UNICEF jerseys which was a really big find! I wouldn't have known to make that connection if I wouldn't have seen the tweets about Lionel Messi who is one of their players." Participant 1 then proceeded to develop an entire poster campaign around this topic.

This discussion leads to perhaps the most important result from this study, participants reported that TweetSpiration generated keywords they would not have thought of on their own (M=4.4), see Figure 4. These keywords often provided new search directions or a different perspective of the design problem. For example, Participant 6 stated, "The keywords generated in TweetSpiration shifted my perspective... I saw words that started generating ideas in my mind... that got me to think about the problem from a different perspective". Participant 8 added to this thought, "TweetSpiration is a neat thought train; it's a way to find things you wouldn't have found just Googling because you don't know what to type in to find relevant information". Participant 7 also thought TweetSpiration was useful because it provided "information you don't see on the UNICEF Webpage, things that are less formal, but things people on Twitter talk about."

Six of the eight participants had similar favorable attitudes as they stated they would 'definitely use the application again'. Our participants also felt the interface was easy to learn (M=4.6), easy to use (4.4) and generated a lot of useful keywords (M=4.1).

Although TweetSpiration has shown promise for inspiring new search directions, there are features that could be altered to improve its ability to inspire new design ideas, namely a better integration with image search. Participant 7 noted that the textual base of TweetSpiration made him/her think less of the visual aspects of the design and more about the textual aspects so they had to rely more on image searches for visual inspiration. In fact, most of the participants in our study performed image searches in the browser window with words from TweetSpiration. Participant 2 noted, "More information, displayed correctly, in a good layout would be extremely helpful. What I have here, tweet results, word associations, images - what more could you ask for?"

It is also interesting to note that none of our participants used the 'hide tweet' functionality during our study. When asked 'why not' Participant 3 said, "I never really hid the tweets because I wanted to see what people were saying about it (the topic)." Participant 8 mimicked this response, "The word cloud would give a clue as to what I would be interested in but I really liked the tweets because they gave me more input than the words themselves." Although none of our participants used this function, they also liked 'the ability to hide them if I wanted to later.'

Although feature changes could add to the devices ability to inspire new design directions, our participants

view of TweetSpiration for inspirational searching can be summed up by Participant 1 who stated, "The application really did live up to its name, it really did provide inspiration for further searches, searches I wouldn't have known to make without using the tool."

Conclusion and Future Work

Our initial study of TweetSpiration has shown that by filtering social media content, we can help designers develop new search terms and new search directions on the Web. These search directions often lead to new ideas, ideas designers may not have developed with traditional Web search alone. Our application does not seek to replace existing Web search interfaces, but instead to complement them by providing alternative search paths when designers are mentally stuck and cannot develop new search directions or search terms on their own. By leveraging social networking sites to visualize others opinions, our users can develop new associations and new perspectives on the search topic.

The next step in our work is to make improvements to our application such as integrating TweetSpiration with image based searches and providing more feature options to our users. We also plan to perform a longer term, more in-depth study with professional designers to determine how often and for what purposes designers utilize TweetSpiration during the design process. We are also interested in how TweetSpiration affects their search strategy. By performing this type of study, we can gain deeper insights into the utility of TweetSpiration for inspirational searching.

Finally, although TweetSpiration was developed to help designers develop new search directions on the Web, the application may also be useful for other users and

for other purposes. Therefore, future studies will also explore how, and for what purposes traditional Web searchers use TweetSpiration.

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