

Signaling Emotion in Tagclouds

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ABSTRACT

In order to create more attractive tagclouds that get people interested in tagged content, we propose a simple but novel tagcloud where font size is determined by tag's entropy value, not the popularity to its content. Our method raises users' emotional interest in the content by emphasizing more emotional tags. Our initial experiments show that emotional tagclouds attract more attention than normal tagclouds at first look; thus they will enhance the role of tagcloud as a social signaller.

Categories and Subject Descriptors

H.5.4 [Hypertext/Hypermedia]: Navigation

General Terms

Design

Keywords

Tagcloud, Folksonomy, Tagging, Classification

1. INTRODUCTION

A tagcloud is a visual presentation of a set of words related to an object (or a collection of objects); a site, a blog entry, a person, etc. The size of a word is determined by the popularity to the tagged object; representatively the number of tagged time with each tag determines the size. The larger the tag is, the more the tag has weight on the tagged object.

In spite of their simple form, tagclouds have drawn a lot of attention from research communities [3, 4, 5, 6, 7, 8]. How users tag objects was surveyed by James et al. [8]; they found tagclouds are not enough to help users navigate. Rivadeneira et al. [7] performed evaluation studies on impression formation. As for goal-orientated tasks, simple alphabetical word lists are preferred over tagclouds [5]. Nielsen [6] pursued the so-called second generation tagclouds, which offer several improvements to overcome tagcloud limitations. Kaser et al. [4] proposed algorithms to create 2D tagclouds. A recent interview analysis by Hearst et al. [3] concluded that the main value of tagclouds is as a signal or maker of individual or social interaction with information.

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WWW 2009, April 20–24, 2009, Madrid, Spain.
ACM 978-1-60558-487-4/09/04.

Considering the role of tagcloud as a social signaller, it is important to attract peoples' attention rapidly. Our hypothesis is that people pay more attention to the content tagged with emotional tags than reasonable tags at their first look. Thus, we propose here *emotional* tagclouds, where tag size is determined by its entropy value. Our method simply picks up popular tags to describe the content as usual but a tag with high entropy is emphasized by enlarged font size. We evaluated our method by users and found that, at a first look, emotional tagclouds gather more attention than ordinary tagclouds.

2. PROBLEM SETTING

We consider that the problem is one of more fully utilizing the material posted on the web by providing social signaling tools that more rapidly attract the attention of users. For this task, our solution is to create more attractive (emotional) tagclouds.

We consider to realize tagcloud in a text layout. From our preliminary survey, alphabetical ordering is the best ordering for users to understand the tagclouds, which is also confirmed by related work [5].

3. PROPOSED METHOD

We crawled a set of folksonomy triples composed of user, tag, and URL collected from delicious.com in a month period and used it as our test data. The number of users, tags and URLs were 806661, 561952, and 54366, respectively.

From careful observation of tags attached to the URLs in the data set, we noticed two facts. One, tag popularity is a good criterion with which to pick up tags for content description. Two, we found there may tags contained words that represented "Identifying Qualities or Characteristics" [2] like *cool*, *fun*, *weird*. We call these tags as *emotional* tags in this paper. Further observation of these emotional tags found that they tend to have higher entropy than other tags [1]. Given these observations, we developed a strategy for creating emotional tagclouds, see Table 1.

Before calculating tag entropy, we apply the semantic smoothing technique proposed by Wu et al. [9], which grasps the semantic relationship among folksonomy triples better than naive sparse vector model [1]. In a preliminary experiment, the entropy of probabilistic distributions offered higher precision for extracting emotional tags than the entropy yielded by sparse vector model.

Fig. 1 shows examples of tagclouds created by both methods. The emotional tag *cool* which has high entropy, is en-

(f_1, \dots, f_n) : available fonts ordered in size
 top_k : top- k popular tags attached to object
 $entropy(t)$: entropy value of tag t
 e_{max} : the maximum entropy of top- k tags.
 e_{min} : the minimum entropy of top- k tags.
 $range = \lfloor \frac{e_{max} - e_{min}}{f_n} \rfloor$

- 1 **for** each tag $t \in top_k$
- 2 set font size of t as $f_{\frac{entropy(t) - e_{min}}{range}}$
- 3 **endfor**

Table 1: Tag cloud generation.

larged in the right cloud.



Figure 1: Normal tagclouds (left) and emotional tagclouds (right).

4. EVALUATION

Our experimental setup is as follows.

1. We picked 9 popular URLs that are tagged with *cool*, *fun*, *weird*, and *これはすごい* (*great*).
2. For each picked URL, title, snippet and two tagclouds (normal and emotional) were shown to users. In the normal cloud, font size is determined by popularity. The two tagclouds were shown side-by-side. Since we assigned tagclouds randomly, left or right, users do not know which was normal and which was our proposal.
3. Users selected the preferred tagcloud two times; at first look, and after understanding the content of the URLs. The two questions were posed; (**attraction**) which is attractive, and (**description**) which well describes the content.
4. After each trial, users selected one of three interest levels; high, neutral, and low, for the URL content itself.

Table 2 and Table 3 show the results in all interest levels and only high interest level, respectively. Of those users

	first look	after understanding
attraction	69.4%	59.7%
description	50%	47.2%

Table 2: The percentage of users (all interest levels) who selected emotional tagclouds.

	first look	after understanding
attraction	76.3%	60.5%
description	57.9%	47.4.0%

Table 3: The percentage of users (high interest level) who selected emotional tagclouds.

who had high interest level to the content, 70% of them selected emotional tagclouds. On the other hand, normal tagclouds are perceived to be better for describing content, especially after understanding the content. Since eight users participated in the experiment, this result is preliminary.

5. SUMMARY

In this paper, we proposed a novel tagcloud where font size is determined by tag entropy value not tag popularity. Our initial experiments showed that emotional tagclouds are more attractive at first look than normal tagclouds, whose font size is determined by tag popularity. Other observations from our experiments are listed below.

1. At first look timing, users see only the large tags. Thus determining which tag in a tagcloud is largest is important.
2. The distribution of font size is important. Tagclouds that have only one tag is large and all the others are small are perceived to be unattractive and not descriptive. Emotional tagclouds rarely have this structure since the emotional tags exhibit smooth distributions, i.e. no fat-tailed distributions, unlike the normal tagclouds.
3. The users' like and dislike of tag content is important. Some users felt bored with *cool* since it appears several times in the experiment, and another user felt that the result was a bit like spam.

As future work, we'll conduct a more detailed user evaluation and pursue more attractive tagclouds as social signallers on the web.

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