

# Tagscape: Navigating the Tag Landscape

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**Abstract.** Recent years have seen an explosion in online collaborative tagging, the most prevalent visualization of which are tag clouds. Despite their popularity, tag clouds suffer from limitations of separation from tagged items, lack of relational information between tags and a less-than-fully interactive experience. In this paper we introduce Tagscape, a tag system interface that attempts to address these issues. Tagscape uses a magnet analogy to represent relationships between tags and tagged items as attractions and repulsions. Preliminary informal evaluations of the interface were positive and revealed avenues for future work.

## 1 Introduction

Tagging systems have played an important role in the popularly termed Web 2.0 movement, garnering much academic interest. Most of the recent work in this area, however, has concentrated on the semantic aspects of tagging, termed *folksonomy*. This research provides a strong basis for the usage trends in and semantic problems with tagging [3] as well as current tagging system designs [6], but does not examine the applied aspects of user interaction with these systems.

The limited work involving tag browsing has focused on the tag cloud due to growing popularity among social tagging-based systems such as Flickr, Del.icio.us, Technorati and Last.fm. The tag cloud is an alphabetic list of words where font size indicates frequency of tag use. Once a user clicks on a tag, a new page is displayed presenting items associated with that label. Research of tag clouds has concentrated on the effect of layout and font size on information retrieval and recall [4, 8].

Researchers have proposed modifications to the traditional tag cloud including abandoning alphabetical listings for an algorithm that clusters tags within a cloud based on semantic relationships [5] and re-shaping the boxed form into a circular structure with distance to the center and font size indicating importance [1]. Another attempt visualizes the relationship between tags by proposing a graph with tags as nodes and edges (distance between nodes) as similarity between tags [9]. Additionally, third-party tag visualization tools are available (e.g. Extisp.icio.us, Fac.etio.us, and Tag.alicio.us). While these modified versions present improvements upon traditional tag clouds, they do not address both issues of separation between tags and tagged items and lack of information about the relationship between tags.

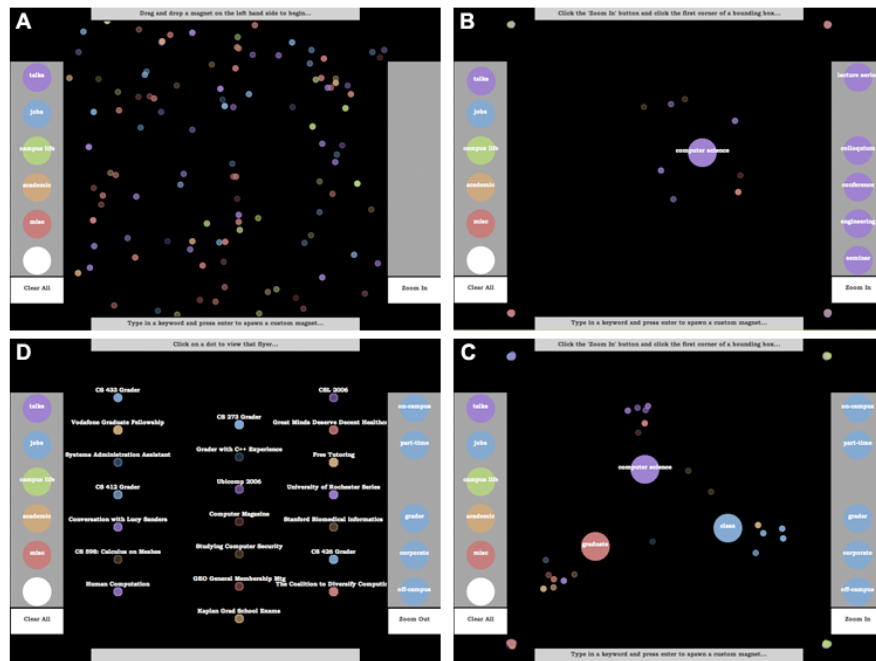
Though the tag cloud is widely used, it may not be the best method for tag visualization [4]. Issues with tag clouds include separation between tags and tagged items, lack

of information about relationships between tags and a less interactive user experience, especially when compared to their context of use.

Tagscape contributes to this research by presenting a rich interface that allows simultaneous browsing of both tags and tagged items. By interacting with both aspects of tagging systems at once, users can see more meaningful metadata about not only the number of items tagged with a certain phrase but also the relationships between tags.

## 2 Tagscape

The current Tagscape prototype uses flyers as the tagged content, based on data from 100 unique flyers on corkboards in a university’s computer science building. It was implemented using Processing and Jeffrey Traer Bernstein’s physics library [7, 10]. The interface relies on the metaphor of magnets – each tag acts as a magnet, attracting or repelling flyers which are represented as dots.



**Fig. 1.** (A) Tagscape in idle state. (B) Flyer-tag interaction. (C) Multiple magnet interaction. (D) Zoomed in view of flyers.

The layout consists of a left-hand tray containing the first-level tags, and a right-hand tray containing the most popular tags under the selected first-level tag. The magnets in the left-hand tray are static features of the system, determined from the physical

flyers studied. The last magnet in the left-hand tray is blank, facilitating user-defined tag search if the 35 pre-selected options are not adequate. The right-hand tray is populated upon reload, and has five different configurations based on the currently selected first-level tag. The items themselves move around the centerfield in the idle state (see Fig. 1. A), where they also interact with user-placed magnets.

Although this specific adaptation uses a two-level tag hierarchy, the system could easily be applied to a flat tagging scheme with limited modification. The main benefit of the two-level scheme in this implementation is color association of the top-level tags with related flyers – more information is integrated in the visualization. The color saturation levels of the flyer dots integrate additional information about time – higher color saturations imply events approaching the present, while flyers far from the present are less saturated.

In order to browse tags, the user drags a magnet onto the field. This attracts all flyers having that tag to the area around the magnet and repels irrelevant flyers to the corners of the field (see Fig. 1. B). A spring-based algorithm creates these attractive and repulsive forces in a method similar to Visual Who [2]. The user removes magnets by dragging them back into the tray or by using the “Clear All” button at the bottom of the left-hand tray.

The system is best suited for exploring relationships between multiple tags. If two tags are placed some distance apart on the field, flyers that are pertinent to both settle between the two magnets, while flyers that are relevant to only one tag come to rest outside the two tags (see Fig. 1. C). Similarly, if the user wishes to filter irrelevant flyers, he or she can move magnets to a corner. This method immediately and visually presents the user with information about tag relations – how many flyers exist within the system pertaining to the placed tags as well as how many flyers relate to multiple placed tags.

The user can zoom in on interesting flyers by clicking and dragging in negative field space around the flyer. The zoomed view reveals the titles of the flyers within that region (see Fig. 1. D). From the zoomed view, the user can either return to searching using the “Zoom Out” button or double click on a dot, which opens the flyer in a new window.

### 3 Evaluation

An informal study of Tagscape was conducted with 16 users. Users were given time to play with the interface and were then asked to complete a set of tasks such as finding a specific flyer. Following interaction with the system, users were given an anonymous survey composed primarily of five-point Likert scales. Users generally rated the interface well, giving it an average score of 4.06 with 1 being “extremely unsatisfied” and 5 being “extremely satisfied.”

Many users found the system engaging and most indicated they would use it again if given the opportunity. While users initially required some instruction, given in the form of a help bar at the top of the interface, they quickly grew comfortable with Tagscape. This is reflected in the average ranking of frustration of 3.81 with 1 being “extremely frustrated” and 5 being “not at all frustrated.” Users typically did not think to use the

magnets to filter away unwanted flyers by dragging magnets to the corner, an anticipated behavior. However, some users developed their own ways to use the system – arranging the magnets in patterns or chasing dots with magnets. Users commented that “the UI was relatively intuitive” and that it “makes searching easy.”

## 4 Future Work

The next step in Tagscape’s development will involve improving the user interface to emphasize current aspects of tag cloud representations that were less salient in Tagscape. One such aspect includes the information conveyed about the popularity of a tag; with tag clouds this is quantified using the font size of the tag word – the larger the word the more popular the tag. In Tagscape the popularity of a tag is not revealed until the user interacts with it. This could be improved upon by varying the size of the magnets based on popularity – the larger the magnet the more popular the tag.

Another possible improvement is to implement the interface using AJAX, which not only affords the user a more integrated experience in its normal context of use but also allows the interface to be as large as the user’s browser window instead of the fixed resolution of a Processing applet. Following such changes, detailed user studies will be conducted comparing Tagscape to current tag cloud implementations.

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