iClone: Towards Online Social Navigation

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ABSTRACT

For a place that gathers millions of people the Web seems pretty lonely at times. This is mainly due to the current predominant browsing scenario; that of an individual participating in an autonomous surfing session. We believe that people should be seen as an integral part of the browsing and searching activity towards a concept known as social navigation. Based on this observation we present iClone (www.iclone.com), a social web browser that is able to raise awareness of other people surfing similar websites at the same time by utilizing temporal correlations of their web history logs and to facilitate online communication and collaboration.

Categories and Subject Descriptors

H.4.3 [**Information Systems Applications**]: Communications Applications—*Information browsers*

General Terms

Algorithms, Design, Human Factors

Keywords

Social Navigation, Collaboration, Browsing

1. INTRODUCTION

The web browser remains the main software application for accessing and interacting with online information. However, current browsing experience over the Internet is typically passive, in a sense that a user's objective is not shared by anyone else and people cannot interact with web content, make personal notes, share comments and URLs.

We build on this observation and focus on enhancing the user browsing experience towards a process known as social navigation. *Social navigation* [2] describes the process where a number of people that share interests and searching goals decide to coordinate their efforts. Systems based on social navigation concepts typically make people more aware of others and their actions. Awareness contributes to a more social experience of the information space,
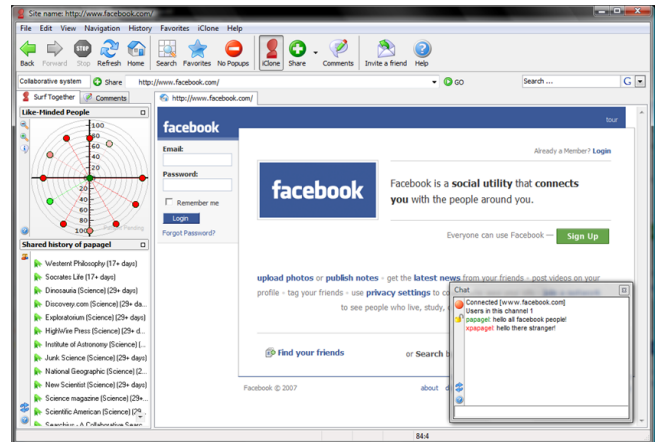
Figure 1: The web browser application. On the left, the *semantic neighborhood radar* (top) and the *shared history list* (down) of a user are presented. On the right, the *website-based chat* is presented that enables communication between users that co-exist in a website. On the top the *collaborative annotation tool* is presented that allows annotations to be assigned to shared websites (button "Share" near the address bar).

makes a *space* feel more alive and turns it into something we might perceive as *place* [3].

To this end, we present iClone, a system that enables online social navigation by utilizing web history logs to identify *recent navigational patterns*. Given such an environment we make the following contributions: (a) we extend the typical web browser's scope by providing means for connecting, communicating and sharing information with relevant users in a synchronous way, (b) we present a novel user interface that is able to visualize social awareness and affordances of the social navigation.

2. SYSTEM DESCRIPTION

Our system is implemented as a stand-alone web browser application. More specifically, it consists of a number of tools, tightly integrated with a typical browser to extend its functionality. During the navigation process, information is collected and communicated to the main web server. Therefore, our system resembles the client-server architecture model, where many clients (web browsers) connect to a main server. Figure 1 presents a typical screenshot of this application from the end-user's point of view. In the remaining of the section we describe these extensions.

2.1 The Semantic Neighborhood Radar

Visualizing a concept is often challenging, since one needs to
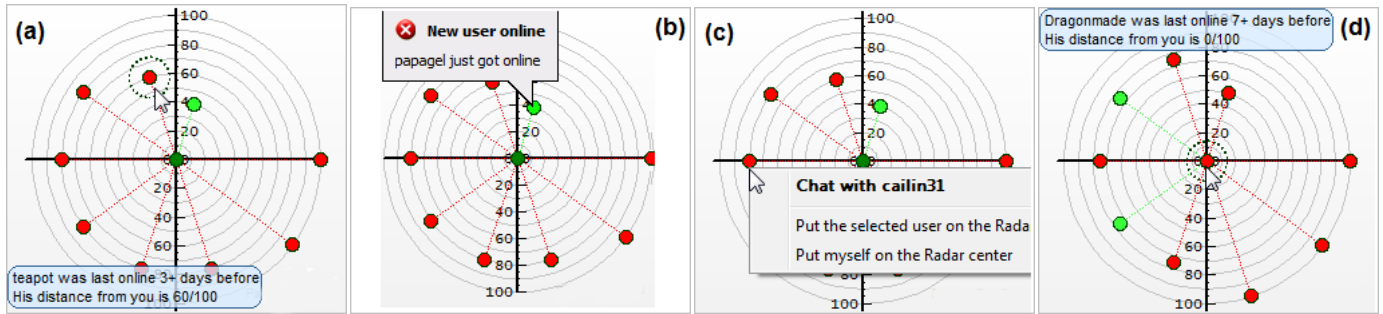
Figure 2: (a) The active user appears at the center of the radar. The distance of the dot at the center of the radar to any other dot represents the proximity of the users represented by these dots. The color of a dot represents the status of the associated user. By moving the mouse pointer over the radar we can discover more information for each user. (b) Activity indicators inform a user about the recent activities of other people in the neighborhood. (c) By right-clicking on a person, options to invite him to a private chat or to put him at the center of the radar are provided. (d) Choosing another person at the center of the radar reveals the users in his neighborhood.

balance between informative, comprehensive and computationally feasible interfaces [1]. We choose to represent the information of recently relevant users using a radar metaphor. A radar in the real world, that operates on an object x (the reflector), scans a wide area, measures the distance of other objects to x and presents these objects along with their distances from x on a display.

The radar represents people as dots. The active user, for which the radar is defined, appears at the center, while the people most relevant to the active user are plotted on the radar in distances from the center that respect the computed proximity of each user to the active user (see Figure 2(a)). Conceptually, this represents a *semantic neighborhood* around the active user, with the captured semantic being the correlation of recent user web history logs.

The radar metaphor evokes the proximity functionality we discussed, but also adds new features such as:

- **Representing the Time-axis on the Radar**: When representing users on the radar we clearly indicate whether they are recently active (green dots) or inactive (red dots). Furthermore, to represent recency we use a spectrum of its color (either green or red) that spans from dark to light, with darker meaning more recently (see Figure 2(a)).

- **Action Indicators**: Action indicators in iClone track the activity of people in the neighborhood and communicate the actions to the user (e.g., who got online, etc.). Action indicators are visualized in the form of a balloon assigned to a specific user. By this way, despite the stateless environment on which browsers operate, we are able to track the state of the radar information (see Figure 2(b)).

- **Private Chat**: A form of direct communication provided by the system is the private chat. A user is able to start a private chat conversation (after invitation) with any of the users presented in the semantic neighborhood radar (see Figure 2(c)).

- **Exploration of other Neighborhoods**: The radar visualization provides the possibility to set another user at its center. Thus, one can explore the neighborhood (the relevant users) of another user. By traversing from a neighborhood to another, one can discover and communicate with more people (see Figure 2(c) and Figure 2(d)). A more intuitive way for a user to explore close neighborhoods is to slightly alter his interests by navigating to other websites. The radar will quickly adapt to the more recent navigation of the user and update the set of the displayed users.

2.2 Website-based Chat

The website-based chat allows people that coexist in a website, during their navigation, to directly communicate with each other. Navigating a website automatically makes you a part of that website's *virtual public chat room*. Therefore communication between all users in a specific website is enabled (see Figure 1). Note, that our system enables the concurrent communication of users at any website and is not the same with the Web applications that allow to a website owner to directly communicate with its visitors. Interestingly, the website-based chat forms the foundation for transforming a *space* to *place* [3].

2.3 Sharing Information Spaces

Pointing out interesting information in a collaborative system is essential. Beyond (private or public) chatting, our system further supports exchange of information in the form of a shared history feature. During navigation, a user may share websites (along with tags) with the people that appear in the radar. A user receiving suggestions for websites would need to click on a user's dot at the radar to indicate its intention to see this list (see Figure 1).

3. CONCLUDING REMARKS

We presented iClone, a social navigation system that enhances the social scope of a typical web browser. Notably, iClone is able to raise awareness that other people coexist in a website and have similar information needs at the same time. Once identified, these users are presented in an informative way that further enables online communication and collaboration. The main idea of iClone is to utilize temporal correlations between users' web history logs. Though intuitive the realization of such a system is not trivial since it poses a number of challenges spanning from technical to social aspects. Our work makes the assumption that people are willing to reveal part of their private information in order to benefit from the system. Overall, iClone forms the foundation for a practical social navigation system.

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