
Enriching Encounters with Social Networks

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Abstract

We believe that a shared encounter augmented with social network information can improve communication, team socialization, and interactions within a company. As an example of this, we present the design concept and initial prototype of an application named Constellation.

Keywords

Always-on video, distance collaboration, social network visualization, casual interaction, computer-supported cooperative work.

Introduction

Within organizations, social network analysis is most commonly used to analyze relationship structures and to identify patterns, such as information hubs and voids [1]. Another common use of social network analysis in companies is to provide tools for expert finding [2]. In contrast with these uses, we are interested in understanding if social network tools can be used to enhance the experience of interacting with colleagues. For example, we want to determine if social network applications can improve interpersonal encounters within a company. Can these tools make the shared encounter a richer experience?

To explore this question, we have begun designing a tool that presents social network information on top of a video portal's display, to provide socially relevant information to the persons communicating across the portal.

Background

Organizations are often interested in improving the interaction between employees working together because this can increase innovation, productivity, and organizational loyalty. There are many different ways in which an organization can try to make the work experience more satisfying: they can alter working conditions, offer work incentives, improve processes, and deploy new office technology. We are interested in exploring whether or not social network tools can provide additional benefit.

There has been a proliferation of social networking websites available on the internet for maintaining friends and colleagues. A few examples include Friendster, MySpace, Facebook and LinkedIn¹. In general, these sites allow for individuals to generate lists of other individuals they know and individuals can share messages, photos, and other media amongst their friends. It has been argued that these sites offer users a way of experiencing shared encounters when they cannot meet in physical space [3]. Others have found, by studying Facebook users, that these sites are used primarily for maintaining friendships between people who know each other offline and meet in physical space [4].

¹ <http://www.friendster.com>, <http://www.myspace.com>, <http://www.facebook.com>, and <http://www.linkedin.com>

Bringing these observations into an organizational context, we believe that revealing social network connections between people can enhance an organizational shared encounter, *if the information is provided within an appropriate context*. For example, we do not think a standalone, simple tool for showing social network information will substantially change the workplace, but if the social network information is tightly coupled to a face-to-face, geographically-bounded interaction, it may. If network information can be used to enhance the physical surroundings in which people already interact, then the tools provided by social networking sites can be informative to the current physical context.

Video portals to encourage collaboration

Large corporations, such as Sun Microsystems, have made significant commitments to supporting distributed work groups, often explicitly encouraging employees to work from their preferred location. The reality of today's workplace is that work teams have less opportunity for informal interactions because they do not see each other face-to-face on a regular basis.

Constellation is a research project at Sun Microsystems which is part of a larger project to connect two office locations through an always-on, life-sized, audio-video portal. The goal of this larger-scale portal project is to address the issue of today's dispersed workplaces and is designed to be a platform for discovering effective methods for encouraging more serendipitous communication across company locations.

Early work on video portals [5, 6] examined the challenges in implementing video connections. They reported on several issues, such as the privacy



Figure 1: These two images illustrate our concept for overlaying social network information on top of a life-sized video connection.

concerns of users and the awkwardness of initiating conversations. We see one of the biggest challenges of this type of display is finding ways to encourage spontaneous, natural communication between two people who might not otherwise communicate. When walking past the portal, you are likely to not recognize the person across the way or know why you should begin speaking with him or her. How can a system stimulate a meaningful, shared encounter across distances?

Our proposed solution to this problem is to overlay social network information on top of the video feed to augment the face-to-face, or “video-to-video,” interaction. This information overlay can visualize the existing relationships between individuals within an organization, highlighting common ground and creating points for discussion.

Constellation

When individuals approach the two sides of the life-sized portal, Constellation is designed to detect the presence of the individuals and show relevant information about the social relations between them. Figure 1 illustrates this proposed interaction. The concept is that when two people approach from the two sides, the overly will show the shortest network paths between the individuals present, to highlight the people they know in common. By presenting this information on top of a video connection, the interaction with the social network and the communication between the people will be merged into a single activity of learning about each other within the context of common social ties.

As a first step towards this vision, Constellation has been built as a software application that can run on a desktop without video integration. The software collects and visualizes the connections individuals have through the company’s organizational chart, their office locations, the co-authorship of academic papers, and the co-invention of patents, all drawn from networked databases. Constellation is implemented today as a Java Applet, using the open-source toolkit Processing [7]. The social network relations are organized using the open-source Java toolkit Jung [8]. The visualization of the network is inspired by earlier work by Heer [9] and Fisher [10].

Figure 2 shows a screenshot of this early prototype of Constellation, running as a stand-alone application for exploring shortest paths and connections between individuals. Each line on the graph represents a relationship between two individuals, where the color indicates type of relationship and the thickness

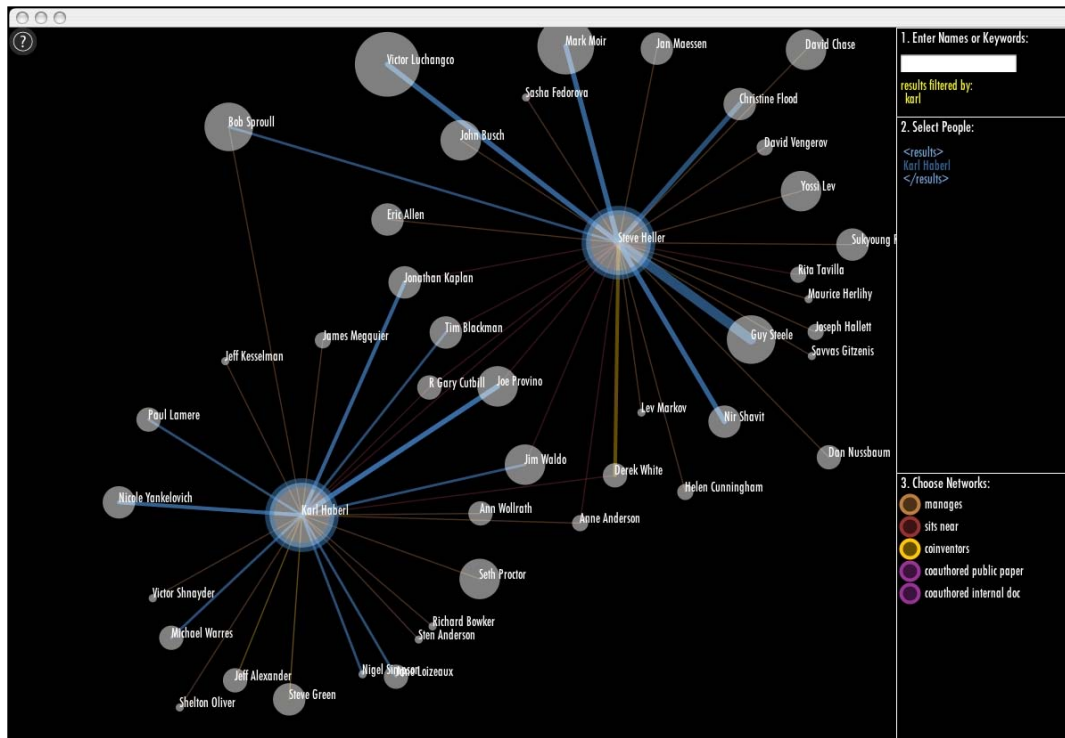


Figure 2: A screenshot from the initial prototype of Constellation, which provides the basic social network

indicates the number of connections (number of co-patents, co-authorships, etc.). By toggling the radio buttons in the lower right corner, users can select which networks are of interest for the current exploration.

As a first iteration, the interaction model of Constellation is heavily dependent on a traditional mouse and keyboard. As we move towards implementing Constellation as an overlay on a life-sized

display, the interaction will need to be re-designed to support more natural, gesture-based interactions.

Beyond the context of video communication, Constellation is in essence a connection facilitator. The prototype supports search, allowing a user to search for someone by name or by a topic of expertise, enabling one to find out how specific individuals directly relate to others in the organization, either by who they sit near, who they have patented with, or who they have written papers with. Each of the views on an individual augments the traditional view of a person within a company's management structure. A final feature of the software prototype is that one can explicitly use the interface to find the shortest path between any two individuals. For example, one can discover the most direct path between themselves and a particular individual they would like to meet. Constellation, rather than presenting an entire network visualization, presents an "individual-centric" view of a network, allowing one individual to explore and discover information about who they and other people are connected to.

Conclusion

One of the challenges of a large, diverse organization is connecting across physical and organizational boundaries. Constellation provides a method for learning about a colleague through their established social connections in the organization. In its future envisioned position, Constellation will augment a remote, face-to-face encounter by providing relevant social network information literally in the face of the communication. While a video link can enable a connection between two remote locations, we hope that Constellation will create a catalyst for a shared

encounter by highlighting the common connections between people while they are present and able to communicate.

In this manner, the Constellation project demonstrates our belief that social network information can enhance the encounters between individuals in offline space. While the early stage of this research cannot prove this proposition, this project illustrates one way in which basic social network information can be incorporated into interactions within organizations. Our aim is to study and deploy such systems to understand how and when this information generates richer shared encounters.

Acknowledgements

This research was done at Sun Microsystems with Brenda Laurel and Scott Nazarian.

References

- [1] Cross, R., S.P. Borgatti, and A. Parker, *Making Invisible Work Visible: Using Social Network Analysis to Support Strategic Collaboration*. California Management Review 44, 2 (2002), 25-46.
- [2] Kautz, H., B. Selman, and M. Shah, *Referral Web: combining social networks and collaborative filtering*. Communications of the ACM 40, 3 (1997), 63-65.
- [3] Boyd, d., *Identity Production in a Networked Culture: Why Youth Heart MySpace, Presented at the American Association for the Advancement of Science* (2006). St. Louis, MO, February 2006.
- [4] Lampe, C., N. Ellison, and C. Steinfield. *A face(book) in the crowd: social searching vs. social browsing*. Proc. *the 2006 Conference on Computer Supported Cooperative Work*, ACM Press (2006), 167 - 170.
- [5] Bly, S.A., S.R. Harrison, and S. Irwin, *Media spaces: bringing people together in a video, audio, and computing environment*. Communications of the ACM 36, 1 (1993), 28-46.
- [6] Fish, R., R.E. Kraut, and B. Chalfonte. *The VideoWindow system in informal communications*. Proc. *Conference on Computer Supported Cooperative Work (CSCW'90)* (1990), 1-11.
- [7] Fry, B. and C. Reas, *Processing Programming Language*, (2004 - 2001). Massachusetts Institute of Technology and Interaction Design Institute Ivrea: Cambridge, MA. Available from: www.processing.org.
- [8] O'Madadhain, J., D. Fisher, S. White, and Y.-B. Boey, *The JUNG (Java Universal Network/Graph) Framework, Technical Report UCI-ICS 03-17* (2004). School of Information and Computer Science, University of California, Irvine. Irvine, CA.
- [9] Heer, J. and d. Boyd. *Vizster: Visualizing Online Social Networks*. Proc. *InfoVis 2005 IEEE Symposium on Information Visualization* (2005).
- [10] Fisher, D. and P. Dourish. *Social and Temporal Structures in Everyday Collaboration*. Proc. *Conference on Human Factors in Computing Systems (CHI 2004)*, ACM Press (2004), 551-558.