Supporting Asynchronous Collaboration in Visual Analytics Systems

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ABSTRACT
Visual analytics involves complex analytical processes that can often benefit from collaboration. Many researchers have explored co-located synchronous systems to help support collaborative visual analytics; however, the process can often be long and require a series of sessions. Providing support for asynchronous collaboration in visual analytics systems can help divide the problem between several analysts across many sessions to ensure that they can effectively work together toward a solution. Currently, visual analytics systems offer limited support for asynchronous, multi-session work \cite{r1}. In this workshop, we seek to bring together researchers from both the CSCW and Visual Analytics communities to discuss avenues for supporting asynchronous collaboration in visual analytics systems.

Categories and Subject Descriptors
H.5.3 [Group and Organization Interfaces]: Asynchronous Interaction

General Terms
Human Factors

1. MOTIVATION
Leading Information Visualization researchers have identified collaborative InfoVis as an important research direction \cite{r2}. To date, most of the work in this area has been dedicated to synchronous, co-located collaboration. Asynchronous visual analytics presents radically different challenges for the collaborators, as there is no direct verbal communication between analysts. Asynchronous collaboration encompasses a number of interesting scenarios, such as handing off an analysis to someone else or supporting a team of analysts working on complementary sections of the data, using different analytical processes in parallel and unifying findings later, or providing asynchronous awareness information about the analytical processes to interested team members. This type of collaboration has been identified as both commonplace and important in areas such as intelligence analysis \cite{r1}. The scenarios identified above require richer history mechanisms capturing both insights and processes \cite{r3}; a topic recently identified as being important by the visual analytics community \cite{r4}. Providing richer means of supporting asynchronous collaboration has also become an important topic in CSCW \cite{r5} so we believe this workshop presents a timely opportunity to reach across disciplines to discuss challenges and exchange ideas for designing visual analytics systems supporting asynchronous work.

2. WORKSHOP PLAN
We will run the workshop over a full day, bringing together researchers from the CSCW and Visual analytics/InfoVis communities. Authors of accepted submissions as well as invited researchers will give short presentations. We will interweave presentation sessions with longer periods of discussions. Presentations will be grouped by key topics to foster spontaneous discussions. If participants are interested, archival publication opportunities will be discussed, in addition to follow-on workshops.

3. ORGANIZERS
Dr. Nathalie Henry Riche is a Researcher at Microsoft Research. Her research interests are in the field of Human-Computer Interaction and Information Visualization. Her principal focus is the visual exploration of graphs and social networks. Nathalie received a Ph.D. in computer science from INRIA/University of Paris-South and University of Sydney. More information is available at http://research.microsoft.com/~nath.

Dr. Kori Inkpen is a Principal Researcher/Research Manager at Microsoft Research, and is head of the Connect team. Her research interests are particularly in the fields of Computer-Supported Cooperative Work and Human-Computer Interaction and she is currently focused on video to support rich collaborative interactions in both the consumer and enterprise spaces. She has been conference co-chair and organiser of many international conferences including CSCW 2010 and Group 2007. Prior to joining Microsoft she was a Professor of Computer Science at Dalhousie University. Further information can be found at: http://research.microsoft.com/en-us/people/kori.

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Dr. John Stasko is a Professor in and the Associate Chair of the School of Interactive Computing at the Georgia Institute of Technology. His research is in the area of human-computer interaction with a specific focus on information visualization and visual analytics. Stasko, an ACM Distinguished Scientist, has been Program Co-Chair for IEEE Information Visualization (InfoVis) Conference and the IEEE Visual Analytics Science and Technology (VAST) Symposium, and is on the Steering Committee for IEEE InfoVis. Further information can be found at http://www.cc.gatech.edu/~stasko.

Dr. Tom Gross is full professor and chair of Human-Computer Interaction at the Faculty of Information Systems and Applied Computer Science of the University of Bamberg, Germany. His research interests are particularly in the fields of Computer-Supported Cooperative Work, Human-Computer Interaction, and Ubiquitous Computing. He has participated in and coordinated activities in various national and international research projects and is a member of the IFIP Technical Committee on ‘Human Computer Interaction’ (TC.13). He has been conference co-chair and organiser of many international conferences. Further information can be found at: http://www.tomgross.net.

Dr. Mary Czerwinski is a Research Manager of the Visualization and Interaction for Business and Entertainment (VIBE) research group at Microsoft Research. Mary’s primary research areas include studying lifelogging, group awareness systems, information visualization and task switching. She has held positions at University of Washington, Compaq Computer Corporation, Rice University, Lockheed Engineering and Sciences Corporation, and Bell Communications Research. She received a Ph.D. in cognitive psychology from Indiana University in Bloomington. More information about Dr. Czerwinski can be found at http://research.microsoft.com/users/marycz.

4. ACCEPTED PAPERS
The abstracts of accepted papers are reported below, ordered by author first name. The full versions of the papers are available as PDFs at:

Large-Scale Examination of Academic Publications Using Statistical Models
Jason Chuang1, Daniel Ramage1, Daniel A. McFarland2
Christopher D. Manning1, Jeffrey Heer1

1 Stanford University, Computer Science Dept, USA
2 Stanford University, School of Education, USA

Abstract: We describe our experiences in three collaborative visual analytics projects on large-scale examination of academic publications using statistical models. We highlight design guidelines learned from these experiences. In many cases, effective analysis results only after aligning the visualization with the analysis tasks, the capabilities of the modeling tools, and concepts meaningful to the domain experts.

Substantiating findings from the analyses often requires verifying and modifying the underlying statistical models. We demonstrate that alignment allows analysts to verify model outputs by comparing them to domain knowledge and gain trust in the validity of findings derived from the models. Verification often leads to model modifications (changes in assumptions, parameter search, or sensitivity analysis); visualization can expose modeling abstractions, and help model builders better understand and alter the characteristics of the models. Displaying appropriate units of analysis also facilitates communication among collaborators with different backgrounds and expertise.

Weave: A Web-based Architecture Supporting Asynchronous and Real-time Collaboration
Andrew Dufilie1, John Fallon1, Patrick Stickney1, George Grinstein1

1 University of Massachusetts Lowell, USA

Abstract: This paper presents Weave, an open-source application framework designed to support both asynchronous and real-time collaborative visualizations. While other frameworks add support for session state as an afterthought, Weave was designed from the beginning with sessioning in mind. The framework allows runtime linking and modification of any parameter. Changes in the session state are stored in memory to allow undo, redo and replay capabilities. A session history file can be saved and shared with other analysts for asynchronous collaboration. Weave can also share live session-state updates over a chat server to allow realtime collaboration across multiple web browsers, whether the analysts are co-located or not. Sharing not just the visualization and data, but also the process involved to arrive at the visualization provides numerous opportunities for further research in collaborative visual analytics for the masses.

From the Individual to the Group: Integrating Asynchronous Collaboration with Co-located Work
Petra Isenberg1, Jean-Daniel Fekete1

1 INRIA, France

Abstract: A large amount of data analysis work is conducted by individuals interspersed with formally arranged or spontaneous face-to-face meetings. Visual analytics tools provide no easy solution to bridge the gap between such individual and face-to-face work situations. They are typically either designed to work well for individuals or for teams but do not support to be used interchangeably in both synchronous and asynchronous work settings. In order to make collaboration effortless and
worth undertaking, however, individuals have to be able to fluidly switch in and out of synchronous collaboration with others, to bring their own data, its visual representations, as well as all data modifications and annotations to a shared meeting where both data and representations can not only be presented but also interacted with, modified, and further analyzed together with others.

**House: A messaging platform to support geographically disconnected families**
Manoj Krishnan¹, Karrie Karahalios¹

¹ Department of Computer Science, University of Illinois, USA

**Abstract:** In this paper, we present House, a messaging platform for members of geographically disconnected families to stay connected. House is a lightweight, real-time interface designed to help such families communicate with each other. Specifically, it helps families re-discover the joys of communicating trivial and silly information between each other and is a departure from the objectives of current social networks. We discuss the design rationale behind the House interface and also discuss specifics about what existing technologies lack and how we hope to overcome these shortcomings to help geographically disconnected families rediscover the sense of nearness to fellow family members.

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**REFERENCES**