An Interactive Session Using a Tool to Support Distributed Conversations around Digital Video

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Workshop Theme and Objectives

Jordan and Henderson (1995) outline a research methodology they term *interaction analysis*—a powerful method for investigating human activity in which a group of researchers come together in a meeting to offer their insights on some video recorded event. Although the interaction analysis approach proved to be highly influential for ethnographers and other social scientists, it was limited by the technologies available at the time of Jordan and Henderson's writing (VHS tapes, etc.). Reconstructing the contextually grounded insights of researchers can be an onerous task, not to mention the challenge of accommodating the schedules of several busy researchers. Fortunately, the decreasing costs and increased accessibility of digital video technologies has made it possible to support fluid conversations around a video record without the constraints of an in-person meeting. Pea, Lindgren, and Rosen (2006) present a framework for enhancing interaction analysis with internet technologies that they term computer-supported collaborative video analysis (CSCVA). They also describe a software environment designed to facilitate CSCVA in the research community called DIVER (Digital Interactive Video Exploration and Reflection). The purpose of this session will be introduce to participants the theoretical issues around CSCVA and give them practice collaborating on video analysis using the DIVER platform. Session participants will have access to a large video data corpus that we have collected on families discussing the role that mathematics plays in activity at home. The goal of the session is to build fluency among participants with CSCVA tools and to have them recognize the potential for using these types of tools to improve and expand their research practices.

DIVER

DIVER is a web-based application that allows researchers to use their web browser to view digital video clips and add text annotations to specific points in space and time within the video; it is an authoring process that we refer to as making a "dive" (Pea, 2006). By controlling a viewing rectangle that is overlaid on the video, a researcher can direct the attention of other researchers to the specific points that support the argument they are trying to make about the activity in the video (see Figure 1). The DIVER application includes several additional features that support conversation around video amongst distributed individuals, including the capabilities of: (1) integrating the analyses from multiple video sources into a single dive; (2) "remixing" a dive into a stand-alone presentation of the video analysis; and (3) sharing specific dive segments (e.g., zoomed region of an interaction for a temporal subset of the clip) with annotations through an e-mail webpage link. DIVER is one of the research tools in use by researchers and partners of the NSF funded Science of Learning Center known as LIFE (Learning in Informal and Formal Environments: http://life-slc.org/).
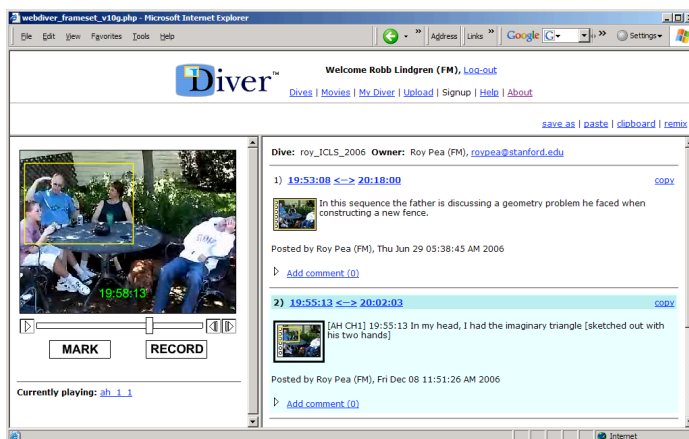

Figure 1. A researcher's dive on a Family Math Project video. The researcher has used the viewing rectangle to the draw attention to the gestures the father uses to describe the geometry problem he was working on.

The Family Math Project Video Data Corpus

The small group video analysis activity in this session will utilize a large set of digital videos recorded by the Family Math Project, another major initiative of the LIFE Center. The goal of the Family Math Project is to identify the cultural contexts that are relevant to mathematics learning and practice, to identify the resources family members use for solving problems together, and to characterize the structure of these activities. The data set includes over 40 hours of videotape from interviews with 20 families where we sought narrative accounts of math in the daily lives of family members.

Session Activities

This event will consist of 3 core activities:

- **A presentation on the theoretical foundations of DIVER and CSCVA.** We will present a brief history of video analysis, challenges for supporting collaborative analysis, and how these challenges have been addressed by software solutions such as DIVER.

- **A DIVER tutorial.** We will show examples and conduct a hands-on tutorial showing the important features and functionality of DIVER.

- **Small group activity working with Family Math Video.** Participants will break into small groups and will conduct their own theoretically-driven analysis of one or more of the available videos. Session organizers will be on-hand to answer both technical and research-orientated questions.

CSCL-2007 Session Organizers (Rutgers University, New Brunswik, NJ)

Roy Pea is a Professor of the Learning Sciences and Director of the Stanford Center for Innovations in Learning, LIFE Center Co-PI, and Co-Lead on the Family Math Project. He has written extensively on distributed cognition, learning and education fostered by advanced technologies including scientific visualization, on-line communities, digital video collaboratories, and wireless handheld computers. His current work involves developing a new paradigm for everyday networked video interactions for learning and communications, and research concerning how informal and formal learning can be better understood and connected.

Shelley Goldman is a Professor of the Learning Sciences and a Co-Lead on the Family Math Project. She is an educational anthropologist working at the intersections of technology, mathematics education, and "best learning practices" who engages video analyses in research.

Robb Lindgren is a doctoral candidate in the Learning Sciences and Technology Design program at Stanford and has been part of the DIVER project team for over 3 years.

Joe Rosen is the senior staff research software engineer at the Stanford Center for Innovations in Learning. He leads the technical programming and maintenance of the DIVER tool-set.

References

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