Chapter 11

Remote Control for Videoconferencing*

Marcia Perry and Deborah Agarwal
Ernest Orlando Lawrence Berkeley National Laboratory

We have designed, implemented, and deployed a camera control system and a conference controller that provide remote control capabilities for videoconferencing over the Internet. The camera control system allows users to pan, tilt, and zoom the cameras, switch between cameras, and get a picture-in-picture view from their desktops. The conference controller allows conference participants to not only start and stop the media tools on a remote host, but also to dynamically change settings and turn transmission on and off. It supports the vic (video) and vat (audio) Internet videoconferencing tools and enhances their usability by providing an integrated and secure user interface for local and remote control of these applications. This paper describes the design and implementation of the camera control system (dervs and camclnt) and the conference controller (confcntlr). The remote control capabilities offered by these tools have changed the videoconferencing paradigm to one of telepresence. With these tools remote users can “walk” around the room, focus in on objects, and actively participate rather than just observe.

INTRODUCTION

The implementation of IP multicast over the Internet has inspired videoconferencing tools for video, audio, session directory, conference management, and shared workspace applications. These tools are built as standalone applications and integrated videoconferencing systems. However, they are de-
signed for people sitting directly at the computer terminal participating in a videoconference and in some conferencing situations there may not be anyone to sit at the computer at a participating site. In the case of collaboratories, our experience has been that the researchers present at an experiment site do not want to tend to the videoconferencing tools in order to select views for the remote collaborators. This is also the case for participants in conference room meetings. However, if no one is at the sending host to execute a video tool or does not turn on transmission, remote users have no way of receiving an image. Also, if the person watching the video wishes to move a remote camera or change the remote settings and is unable to do so, it is frustrating to that remote participant. Remote control of videoconferencing devices can provide a non-disruptive means of moving cameras and improving audio quality locally.

As part of the Distributed Collaboratories project of the Imaging and Distributed Collaborations Group at Lawrence Berkeley Laboratory, we have designed, implemented, and deployed a camera control system and a conference controller. These tools give the remote user a sense of telepresence by providing remote control capabilities for videoconferences over the Internet. With the remote camera control and conference controller, collaborators can “walk” around a remote room, focusing in on what is taking place. This capability allows users to feel more like participants instead of observers. The camera control system consists of a server (devserv) and a client (camclnt) to drive serial-controllable video devices. Devserv is run on the machine directly connected via serial ports to the camera system. Camclnt is the user interface that can be run remotely or locally to control the cameras. Through the camclnt interface the user can control camera pan, tilt, zoom, and picture-in-picture. The devserv and camclnt programs communicate via IP multicast and UDP unicast.

The conference control tool, confcntl, enhances the usability of the media tools vic (video) and vat (audio) by providing an integrated and significantly enhanced user interface to these tools. Confctl allows conference participants from local and remote sites to change media tool settings. Confctl is based on a peer-to-peer architecture and it uses TCP connections to exchange messages over the Internet and IP multicast for communication with the media tools on the local host.

The remainder of this chapter is organized as follows. The next section surveys related work in multicast-based videoconferencing. The third section discusses the remote camera control system. The fourth section discusses the conference control tool. The final section summarizes the paper and suggests future work.
Asynchronous Communication: Fostering Social Interaction with CollaboraTV

www.igi-global.com/chapter/asynchronous-communication-fostering-social-interaction/29207?camid=4v1a