Chapter XIII

A Framework for Indexing Personal Videoconference

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ABSTRACT

The rapid technical advance of multimedia communication has enabled more and more people to enjoy videoconferences. Traditionally, the personal videoconference is either not recorded or only recorded as ordinary audio and video files that only allow linear access. Moreover, in addition to video and audio channels, other videoconferencing channels, including text chat, file transfer, and whiteboard, also contain valuable information. Therefore, it is not convenient to search or recall the content of videoconference from the archives. However, there exists little research on the management and automatic indexing of personal videoconferences. The existing methods for video indexing, lecture indexing, and meeting support systems cannot be applied to personal videoconference straightforwardly. This chapter discusses important issues unique to personal videoconference and proposes a comprehensive framework for indexing personal videoconference. The framework consists of three modules: videoconference archive acquisition module, videoconference archive indexing module, and indexed videoconference accessing module. This chapter will elaborate on the design principles and implementation methodologies of each module, as well as the
intra- and inter-module data flows and control flows. Finally, this chapter presents a subjective evaluation protocol for personal videoconference indexing.

INTRODUCTION

Videoconference is an advanced type of meeting approach that employs real-time video communication technology to enable participants in different geographical locations to see and talk to each other. In fact, today’s videoconference employs richer communication media than audio/video, such as text chat, file transfer, whiteboard, and shared applications. Therefore, it should be more precisely called a “multimedia conference.” By convention, we still use the term “videoconference” in this chapter. A few years ago, videoconference was only an expensive option for big companies’ business operations due to the requirement of special hardware and communication lines. With the growth of Internet bandwidth and the development of multimedia communication technologies in past years, videoconference has become more and more popular in business operations (Sprey, 1997). Furthermore, with affordable video and audio capture devices, the advanced low bit-rate coding, and pure-software videoconferencing tools, home users can also enjoy visual communications at 56Kbps or lower (Deshpande & Hwang, 2001). For example, video-based distance learning has benefited significantly from videoconferencing techniques.

A videoconference can be classified as either personal videoconference or group videoconference based on the number of participants at each geographical location. A videoconference is classified as a personal videoconference on the condition that there is only one participant at each location; otherwise, it is a group videoconference. A personal videoconference is usually held among several participants, and each participant sits in front of a computer equipped with a camera, a microphone, and a speaker (or earphone). A group videoconference is often held in a multimedia conference room, where more than one camera and microphones are installed. Existing research on videoconference indexing all focuses on group videoconferences, leading to meeting support systems. Since personal videoconferences are becoming more and more popular recently and the characteristics of personal videoconferences are different from that of group videoconferences, this chapter aims to propose a framework for indexing personal videoconferences.

A participant of a personal videoconference usually wishes to save the content of the conference for the later reference. However, current videoconferencing systems provide little support on this aspect. Even if the streaming video and audio information can be recorded as ordinary video and audio files, these files occupy too much space and do not support non-linear access, so it is not easy to recall the details of a videoconference without watching it again. Therefore, it is very difficult to manage and search those videoconference records, revealing the timely importance of the research on indexing personal videoconferences.

The rest of this chapter is organized as follows. The next section reviews the background of multimedia indexing. Then, we discuss the characteristics of personal videoconference indexing, followed by a proposed comprehensive framework for building a personal videoconference archive indexing system. A subjective evaluation protocol is then presented in the next section. Finally, we draw our conclusions.
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