Videoconferencing

Introduction

The World Wide Web is a multimedia platform. Web-based conferencing is one of those exciting multimedia applications on the Internet. This paper will give you a brief introduction about one type of Web-based conferencing: videoconferencing, and about two of its popular application software packages: CU-SeeMe and Microsoft NetMeeting.

Significance of topic

Videoconferencing is still relatively new for the Internet, but its popularity is growing quickly. It is a full-motion, two-way, video/audio system that permits two or more people in different locations to communicate with each other. Two-way videoconferencing is often used for large groups and by colleges and universities that offer video courses. (*Gehris, 1998, p.164*)

Videoconferencing is often used in distance learning and Web-based courses. Colleges and universities have been providing live broadcasts of lectures and seminars to some of their students who are unable to travel to class sites. The justification of using videoconferencing in education may also come from concepts and principles related to social learning and social constructivist theory. (*Abbey, 2000, p.62*)

In business settings, videoconferencing is used for employee training, group work or to introduce a new product, service or procedure.

Understanding what are required for videoconferencing and what software programs are available becomes more and more important to people working in education and

business, and also for those who are enthusiastic about personal communication in this way.

Discussion

There are some special requirements for videoconferencing:

1. Hardware Requirements for Videoconferencing:

- Computer (PC or Mac) with fast processor speed and large RAM
- Video camcorder (which requires a video capture card for PC or AV card for Mac)
- Speakers
- Microphone

2. Internet Connection Requirements for Videoconferencing:

- ISDN *or*
- ADSL *or*
- Two-way cable modem *or*
- *Other high speed connections*

3. Software:

The two most popular videoconferencing software being used over the Internet are CU-SeeMe and Microsoft NetMeeting.

A. CU-SeeMe

CU-SeeMe is a videoconferencing program which combines audio, video and text-based chat capabilities that can be used equally as well with both PCs and Macs. It is an application initially developed at Cornell University (therefore the "CU") and later further developed by White Pine Software (the product is called Enhance CU-SeeMe). With CU-SeeMe, you can videoconference with another site located anywhere in the world. By

using a reflector, which are videoconferencing chat rooms, you can see and communicate with a number of people from different sites at the same time. (*North Carolina State Research and Graduate Studies*)

The following are detailed information for these two types of CU-SeeMe:

	CU-SeeMe	**CU-SeeMe (Enhanced)**
Provider	Cornell University and White Pine (www.wpine.com)	**White Pine Software** (www.wpine.com)
Platforms	PC, Macintosh	PC and Mac
Requirements	Video camera.	Video camera

	PC
	    386DX or higher, Microsoft Windows 3.1+, Windows Sockets compliant TCP/IP, 8 bit video driver, video hardware supporting Microsoft Video For Windows.
		PC
		    486 or Pentium processor, 8MB RAM, Windows 3.1+, Windows95, Windows/NT, TCP/IP - Winsock compliant.

	Mac
	    68020 or higher, System 7 or higher, 16-level-grayscale display, MacTCP, video hardware (Video Spigot hardware or AV Mac), audio hardware, Quicktime.
		MAC
		    68020, 030, 040, Power Macintosh, 4MB RAM, System 7.0 or greater, TCP/IP - MacTCP included, Open Transport in System 7.5.2. Macintosh PowerPC and Macintosh 68K

LAN Protocols	UDP/IP, IP Multicast.	TCP/IP
Audio Encoding		2.4k Voxware, 8.5k Digitalk, 16K Delta-mod

Video Encoding	Non-standard	White Pine 24-bit True Color, CU-SeeMe Grey
Interoperability Standard Support	Yes, using Unix reflector software.	
Multipoint		Yes - White Pine Reflector - Unlimited
Collaboration Features	None	WhitePineBoard - Object oriented, color, multiuser with text draw objects. Copy, paste, and full editing for information sharing. Chat Window - for non-audio conversations using text entry from keyboard. Filtering for selection of individual conversations.
Price	Free, can be downloaded from http://www.cit.cornell.edu/software/licenses/CUSeeMe.html	$99 Retail, $69 electronic version only purchased over the Internet

Notes: CU-SeeMe offers a total Internet video conferencing software only solution. It can be used as an Internet phone over a low bandwidth 14.4 modem or as a video and audio conferencing solution over a 28.8 modem or higher bandwidth connection. When used with the White Pine Reflector, Enhanced CU-SeeMe supports group conferencing and video for "cybercasting" to large audiences.

In May 2001, a new version, CU-SeeMe v5.0 has been launched worldwide. "The addition of video instant messaging to CUseeMe v5 brings a new element of usability, allowing users to take advantage of their existing buddy lists and presence protocol to know when their contacts are online and available to chat." (*Digital Webcast*) However, the new version is only for computers running the Microsoft Windows operating system.

Here is the "conference room" layout for CU-SeeMe v5.0:
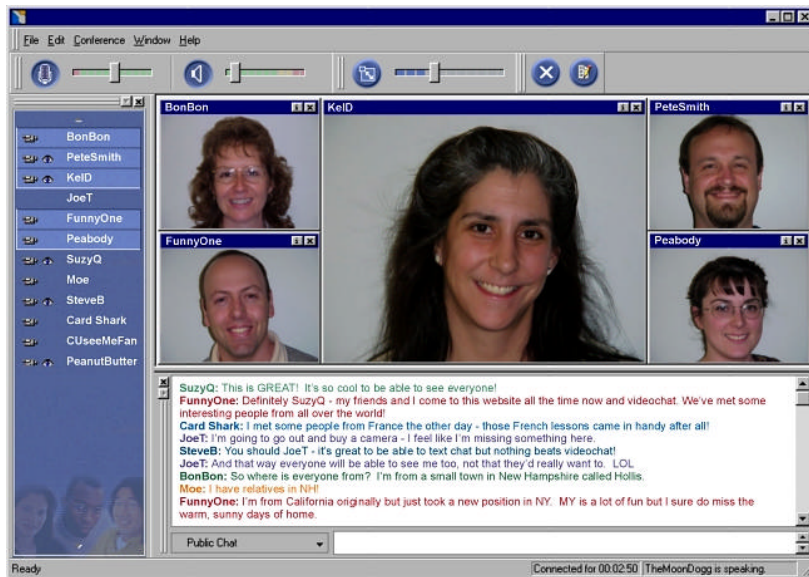
(*Cu-SeeMe Website*)

B. Microsoft NetMeeting

Microsoft's NetMeeting is an Internet videoconferencing package. It can be used over the local LAN, the Internet, ISDN, or over 14.4kbps+ modems. NetMeeting supports the International Telecommunications Union (ITU) H.323 standard for audio and video conferencing and can thus interoperate with other H.323 compliant software packages. H.323 itself is a family of standards that define the transmission of audio and video. It includes H.263 video, G.711 and G.723 audio codecs. NetMeeting also supports the IETF's RTP/RTCP protocol which provides time stamping and synchronization control for the audio flow. While the audio and video are strictly point-to-point, NetMeeting supports multi-point T.120 compliant data conferencing. Some of its data collaboration tools include a shared whiteboard, application sharing, file transfer, and a chat tool. (*Hewitt, North Carolina State University*)

CNET (www.cnet.com) gives the following reviews about Microsoft NetMeeting:

" Superior audio quality; easy to use, includes whiteboard and application-sharing tools for collaborative work."   Hello Direct (www.hellodirect.net) says, "With a range of new features and a simplified user interface NetMeeting is destined to become even more popular for a wide range of professional and personal communication applications."

The following are the minimum system requirements to install and run Microsoft NetMeeting.

- 90 megahertz (MHz) Pentium processor

- 16 megabytes (MB) of RAM for Microsoft Windows 95, Windows 98, Windows Me

- 24 megabytes (MB) of RAM for Microsoft Windows NT version 4.0 (Microsoft Windows NT 4.0 Service Pack 3 or later is required to enable sharing programs on Windows NT.)

- Microsoft Internet Explorer version 4.01 or later

- 28,800 bps or faster modem, integrated services digital network (ISDN), or local area network (LAN) connection (a fast Internet connection works best).

- 4 MB of free hard disk space (an additional 10 MB is needed during installation only to accommodate the initial setup files).

- Sound card with microphone and speakers (required for audio support).

To use the data, audio, and video features of NetMeeting, your computer must meet the following hardware requirements:

- For Windows 95, Windows 98, or Windows Me, a Pentium 90 processor with 16 MB of RAM (a Pentium 133 processor or better with at least 16 MB of RAM is recommended).

- For Windows NT, a Pentium 90 processor with 24 MB of RAM (a Pentium 133 processor or better with at least 32 MB of RAM is recommended).

- 4 MB of free hard disk space (an additional 10 MB is needed during installation only to accommodate the initial setup files).

- 56,000 bps or faster modem, ISDN, or LAN connection.

- Sound card with microphone and speakers (sound card required for both audio and video support).

- Video capture card or camera that provides a Video for Windows capture driver (required for video support).

(*NetMeeting Website*)

Here is the user interface of Microsoft NetMeeting 3.0:

C. Comparison of CU-SeeMe and Microsoft NetMeeting:

The following table compares different features of these two software packages:

	CU-SeeMe	Microsoft NetMeeting
Instant Messaging Instant Messaging via Microsoft MSN Messenger service for point-to-point call	Yes	Yes
Whiteboard The whiteboard lets you collaborate in real time with others via graphic information.	Yes	Yes
Chat Chat lets you conduct real-time conversations via text, with as many people as you like.	Yes	Yes
File Transfer File transfer lets you send one or more files in the background during a conference.	No	Yes
Program Sharing Program Sharing feature lets you flexibly share multiple programs during a conference and retain greater control over the way they're used.	No	Yes
Remote Desktop Sharing Remote Desktop Sharing lets you operate a computer from a remote location.	No	Yes

4. Videoconferencing requires careful planning and presentation. Here are some tips

of planning and preparing videoconferencing in educational settings:

Typically, each hour of video presentation requires 8 to 10 hours of preparation.

- Keep segments short

- Prepare graphics beforehand

- Minimize background distractions

- Limit to six remote sites

- Keep presentation simple

- Explain video quality

- Minimize unnecessary movements

- Send materials ahead of time

More tips on perform professionally in videoconferencing:
- Keep props at hand
- Vary activities to spark interest
- Vary camera angle
- Move smoothly and predictably
- Do not hand write
- Hire a director

(*Horton, 2000, p. 366-367*)

Summary

This paper only presents some preliminary information about videoconferencing and

some of its software programs. It should be noted that "the field of videoconferencing software is rich in variety, and many good products are available, each with its own strengths and weaknesses." (Woolley, Thinkofit Website)

Many e-Learning companies also offer their own software products and services for videoconferencing. For example, Centra (www.centra.com) offers three software products: *Centra Symposium* for virtual classrooms, *Centra Conference* for large group presentations, and *Centra eMeeting* for meetings. All of these are also available as hosted ASP services through *CentraNow* (www.centranow.com).

Nevertheless, videoconferencing will change the way we do business, the way we learn and the way we stay connected with people.

(*Please bear in mind that some information in this paper may become obsolete as technologies evolve, and some URLs may change or disappear without notice.*)

References

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Gehris, Dennis O. (1998) Using Multimedia Tools and Applications on the Internet.
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Horton, William (2000) Designing Web-Based Training. John Wiley & Sons, Inc.

Related links on the web

1. North Carolina University Research and Graduate Studies

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2Encsu%2Eedu%3A80%2Fdox%2Fvideo%2Fproducts%5FC%2Ehtml&DocOffset=56&DocsFound=247&QueryZip=videoconferencing&Collection=ncsu&SearchUrl=http%3A%2F%2Fsearch%2Encsu%2Eedu%2Fs97is%2Evts%3Faction%3DSearch%26QueryZip%3Dvideoconferencing%26ResultTemplate%3Dgeneral%255Fncsu%252Fstndrslp%252Ehts%26QueryText%3Dvideoconferencing%26Collection%3Dncsu%26ResultStart%3D51%26ResultCount%3D10&ViewTemplate=general%5Fncsu%2Fstndviep%2Ehts&ServerKey=Primary&AdminImagePath=%2Fsearch97admimg%2F&Theme=Standard&Company=NC+State+University

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http://www.digitalwebcast.com/Htm/HomeSet1.htm

3. Cu-SeeMe website: http://support.cuseeme.com/cu5/doc/cusm50.htm

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http://www.csc.ncsu.edu/info/mmtech/homeworks/graduate/fall97/hw5/netmeeting.html#About

5. CNet website: www.cnet.com

6. Hello Direct website: www.hellodirect.net

7. Microsoft NetMeeting website:

http://www.microsoft.com/windows/NetMeeting/SystemRequirements/default.ASP

8. Thinkofit website: http://thinkofit.com/webconf/

9. Centra website: www.centra.com

10. CentraNow website: www.centranow.com

11. Videoconference.com website: www.videoconference.com