A Video Interface For Elderly Patients to Review Depth Videos Over Network

Gary Grimm, Zac Crane, Moein Enayati, Marjorie Skubic PhD.

The Problem

Elderly patients in the MU elder-care program desire the ability to review videos stored in a server at MU over the internet. The current interface is complicated and represents data in a very technical manner. This causes issues for elderly users.

Problems can stem from deteriorated hearing, vision, and sense of touch along with physical or mental impairments [2] Many seniors still have interest in using technology, but need something easier to use. [1]

Our Solution

• Entirely new interface for reviewing videos

• Represent data visually

  • Visualization should be simple and represent one thing clearly.

• Bandwidth detection to send videos at different bit rates to reduce loading time

  • Patients who have connections in some rural areas or use Dial-up should benefit from this.

• Easy-to-access interface that is simple and easy to use for the elderly

  • Complicated technology may be intimidating, and including unnecessary functions will likely cause confusion [2]

Motivation

• Elderly may have poor vision, hearing, or sense of touch and potentially mental or physical impairments that can come with age [2]

• Need an interface that meets these needs

• Larger components and readable fonts to accommodate poor eyesight

• Minimal typing

• Simple layout that compartmentalizes different functions to avoid confusion [3]

Network	Available Bandwidth		8	16	32	64	128
	Original	Normalized Scale	7200	14400	28800	57600	115200
2g	236Kbps	236Kbps	30.5	61.0	122.0	244.1	488.1
3g	14Mbps	14336Kbps	0.5	1.0	2.0	4.0	8.0
802.11a	54Mbps	55296Kbps	0.1	0.3	0.5	1.0	2.1
4g	100Mbps	102400Kbps	0.1	0.1	0.3	0.6	1.1
802.11n	600Mbps	614400Kbps	0.0	0.0	0.0	0.1	0.2
Google Fiber	1000Mbps	1024000Kbps	0.0	0.0	0.0	0.1	0.1

Download speeds of certain file sizes on different connections. Dial-up, 2G, and 3G connections don't have the bandwidth to download 64 and 128Kbps videos without a delay

• Not all users are connected to a high speed internet connection. We will have a variety of users and we want to keep performance at its best.

• Network limitations are not always the same and available bandwidth goes down due to

  • Multiple users streaming videos.

  • When the server is transferring videos from the capture device.

  • The server itself may not be capable of handling a large amount of user request to stream videos.
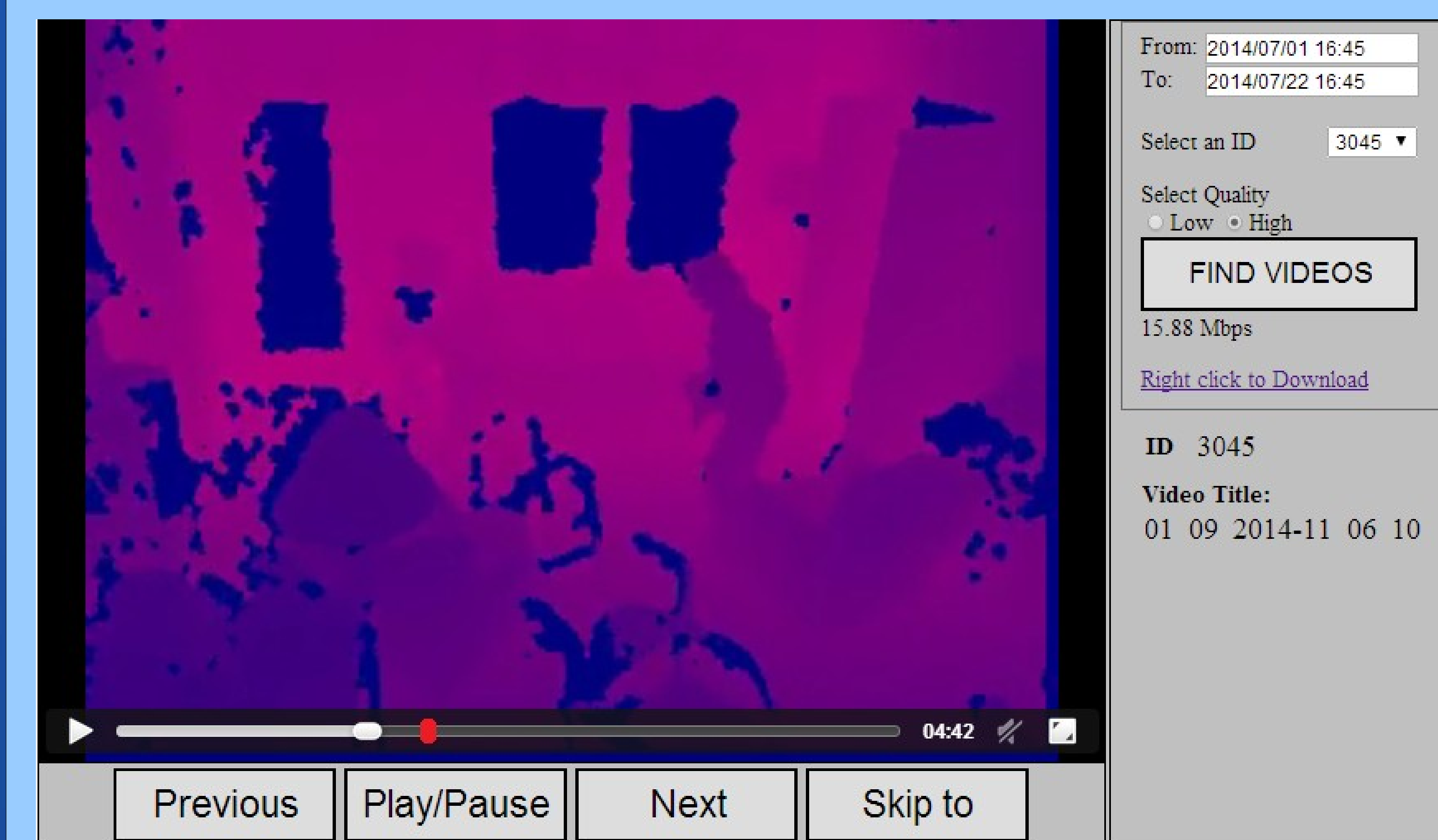
Technologies Used

We used these API's and frameworks to create the video interface. Using pre-made plug-ins allowed us to develop a universal, cross-platform application.

• Google Visualization
• AJAX
• VideoJS
• MP4

•HTML5
•CSS
•PHP
•JQuery

Contributions

• Created an easy to use, fluid and intuitive web page for elderly users

  • Larger text and buttons

  • Used a click-able date time picker to reduce typing

  • Implemented player buttons

• Implemented Bandwidth detection to automatically select video quality

• Used markers to help identify movement and falls in the videos

Video Interface customized for the elderly and uses automatic bandwidth detection to decrease loading times.

References

[1] Demiris, George, et al. "Older adults' attitudes towards and perceptions of' smart home technologies: a pilot study." *Informatics for Health and Social Care* 29.2 (2004): 87-94.

[2] Skubic, Marjorie. "Assessing Mobility and Cognitive Problems in Elders." *AAAI 2005 Fall Symposium, Workshop on Caring Machines: AI in Eldercare, Arlington, VA.* 2005.

[3] Sheahen, Mary; Skubic, Marjorie. Design and Usability of Smart Home Sensor Data User Interface for Clinical and Research Audience. (2014)

Software technologies icons via SoftIcons.com