

USC Shoah Foundation Institute Success Story

About the USC Shoah Foundation Institute for Visual History and Education

The University of Southern California's (USC) Shoah Foundation Institute for Visual History and Education has an archive of almost 52,000 videotaped testimonies from Holocaust survivors and other witnesses. The Institute's mission is to overcome prejudice, intolerance, and bigotry — and the suffering they cause — through the educational use of the visual history testimonies. Toward this end, the Institute works with a global network of partners to advance scholarship and research, provide resources and online tools for educators, and disseminate the testimonies for educational purposes. One means of doing so is providing access to the entire archive via a fast Internet2 connection available to more than 20 institutions on three continents, among them the United States Holocaust Memorial Museum in Washington, D.C. In addition, the Institute's Web site contains a growing number of resources for educators, all of which contain clips of testimony from the archive.

Founded in 1994 by Steven Spielberg, the Institute began recording testimonies the same year. The testimonies have been integrated into high school and college courses worldwide. In addition, documentary film producers have drawn from the archive to create 11 full-length features..

The Challenge

By whatever measure the Institute's archive is assessed, it is huge: 51,682 testimonies representing 32 languages and 56 countries, a total of 105,000 hours recorded on 234,986 Betacam SP master videotapes. The need to capture and preserve those stories was the reason the Institute was founded, and preservation continues to be at the core of the mission. In the words of Kim Simon, the USC Shoah Foundation Institute's managing director: "We exist so that future generations will never forget what so few lived to tell."

Betacam SP was developed in 1986 and remained the industry standard for most television production through the late 1990s. While the image quality is excellent, the medium deteriorates over time even when it is stored in optimal conditions. The USC Shoah Foundation Institute used a conservative estimate of 20 years when calculating how long the Betacam tapes would last before losing quality — a deadline of 2014 for the earliest recordings.

Knowing any preservation effort would take time, the Institute's technical team recognized in the early 2000s that the need to find a more durable means of preservation was urgent.

In 2006, Sam Gustman, chief technology officer for the Institute, identified two realistic choices for beating the clock and preserving the archive. He could make two new, high-quality master videotape copies of each videotape — essentially resetting the clock for another 20 years — or he could take advantage of developing robot technology from a new company called SAMMA Systems to migrate the content to digital storage. (SAMMA Systems was acquired by Front Porch Digital in 2008.)

Although the SAMMA Systems solution was new at the time, it had two compelling advantages. First, it was less expensive than videotape — there

would be almost \$6 million in savings — while still achieving the same results in terms of preserving the audio and video quality of the original recordings. Second, it had the potential to make the stories much more accessible to educators, researchers, and the general public, thus supporting the Institute's educational mission. The project is designed to be completed in five years using the SAMMA products.

The Solution

The USC Shoah Foundation Institute has implemented two Front Porch Digital SAMMA robotic systems to preserve the testimony in the archive by migrating it from the Beta SP masters to more secure and readily accessible digital files. The videotape masters themselves are now stored by Iron Mountain in climate-controlled facilities. To begin their journey into the digital realm, they travel by truck in batches of 15,000 from the storage facility on the East Coast to the Shoah Foundation Institute's operation on the campus of the USC.

The SAMMA Robot™ was developed expressly for the purpose of preserving huge and irreplaceable media collections like the Institute's by automating the process of migrating the content from videotape to digital storage. To do so, it simultaneously ingests and encodes content stored on either U-Matic or, as in the Institute's case, Betacam tapes into multiple digital file formats. Running at full tilt, it can accommodate the volume of as many as six VTRs at one time. The digitized recordings include not only the content itself but also metadata describing the content's condition. As a result, a forensic history of the tapes' condition is preserved along with the digital file. All the content on the tape and the technical information about the recorded signal is preserved in digital form.

For the USC Shoah Foundation Institute, there are two key benefits to the SAMMA robotic system. First, the robotic system is based on a standardized, reliable, and effective videotape to digital file workflow developed by SAMMA. Second, the robotic system's creation of a SHA-1 cryptographic hash function value for each digital file helps assure file integrity when the digital file is stored or copied. A SHA-1 function is the digital file's unique hash algorithm and makes any subsequent change to the file apparent.

Important components of the SAMMA workflow are the videotape cleaners. The cleaners assure the Institute that the videotapes are prepared for the best possible playback before they are placed into the videotape players. The cleaning process removes any deteriorating oxide, metal particles, or dirt from the tape and prevents head clogs, which can prevent the video and audio recording from playing out correctly. The cleaners also have a sensor alert system to flag failed tapes so that they can be put aside for later evaluation and repair. SAMMA tape cleaners typically make it possible for 93 percent of archived tapes to be successfully played back.

Relying on a staff of five, the USC Shoah Foundation Institute processes six videotapes per robot at a time, a total of 12 at once on the two robots. The content is simultaneously digitized to five different file types: a lossless preservation copy in MXF-wrapped JPEG 2000, and duplicates in MPEG-2 at 5 mbps, QuickTime at 1 mbps, Flash at 1 mbps, and Windows Media at 1 mbps. The lower resolution formats are for viewing on personal computers and television.

Corporate Headquarters

2011 Cherry St., Suite 202
Louisville, CO 80027
+1 303 440 7930

International Headquarters

4bis, avenue du Pré de Challes
74940 – Annecy-Le-Vieux, France
+33(0) 4 50 88 37 70

New York Field Office

450 West 31st Street, Fourth Floor
New York, NY 10590
+1 646 240 4045

International Field Offices

France +33 (0) 1 34 89 15 99
India +91 981 899 6603
Singapore +65 3110 3311

The process begins with staff inspecting each tape and placing an identifying barcode label on its cassette spine. The videotapes that pass the inspection phase are loaded into the robot in batches of 60. The migration begins with the robot scanning the barcode labels of each of the 60 tapes for identification. Each tape is then removed from the internal tape library by the robotic arm and moved to the videotape cleaner for cleaning. Upon completion, the tape is moved to one of the six VTRs for playback.

Each Robot processes two batches of 60 tapes per day, five days a week. Using both robots, the total number of tapes migrated per week is approximately 1,200. Once digitized, the preservation, proxy, and metadata files are transferred to two 4-petabyte Sun Storagetek robotic archives. As of June 2009, about 10 percent of the 234,692 tapes had been digitized at an average pace of 240 tapes a day, with 209,432 tapes remaining to be digitized. The project is scheduled to be completed in 2013.

The Future

By saving the USC Shoah Foundation Institute testimonies in derivative formats appropriate for the Web and any commercial video player, the SAMMA digitization process enables the Institute staff to deliver clips more easily to personal computers worldwide, eventually making thousands more available to the general public. Over the course of the next few years, the Institute plans to add more full testimonies and testimony clips to its Web site where they will be available worldwide.

In addition, digitized content – in whatever format -- can be duplicated much more easily than can videotapes. In the past, it took Institute staff two weeks to retrieve content from its remote storage and then physically make a duplicate. As the online database of interviews grows, the efficiency of that workflow will be improved by what Gustman calls “an order of magnitude.” Whether a museum wants 1,000 DVDs or a family member or documentary filmmaker wants a single one, the dramatically shortened processing time means more people can be served more quickly.

Inspired by the experience of making “Schindler’s List,” Steven Spielberg founded the Shoah Foundation to gather video testimonies from survivors and other witnesses of the Holocaust. Now, the archive is one of the largest video digital libraries in the world. In 2006, the Shoah Foundation became the Shoah Foundation Institute for Visual History and Education, part of the USC, which pledged to preserve the testimonies in perpetuity. Today the Institute reaches educators, students, researchers, and scholars around the world and supports efforts to collect testimony from survivors of other genocides, including those in Rwanda and Cambodia.

Front Porch Digital’s SAMMA robotic technology supports the USC Shoah Foundation Institute’s ability to carry out its mission of preservation, access, and education. As a result of the acquisition of SAMMA by Front Porch Digital, the Institute’s technical team anticipates effective ongoing support from a provider whose patented storage technologies manage some of the largest media archives in the world.

Corporate Headquarters

2011 Cherry St., Suite 202
Louisville, CO 80027
+1 303 440 7930

International Headquarters

4bis, avenue du Pré de Challes
74940 – Annecy-Le-Vieux, France
+33(0) 4 50 88 37 70

New York Field Office

450 West 31st Street, Fourth Floor
New York, NY 10590
+1 646 240 4045

International Field Offices

France +33 (0) 1 34 89 15 99
India +91 981 899 6603
Singapore +65 3110 3311