

Protection of Cultural Heritage and Digital Restoration Applications in Cinema, Cinema-TV Center

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The cultural heritage is the most important treasure from past to future. Also institutions which are protector of the cultural heritage have undertaken to bring the past into the present with document and artifacts. The document and artifacts that are products of the cultural heritage; provide us with information with respect to social, cultural and political life of the communities. Also film archives fulfill an important bridge duty between past and future, by transferring cinematographic documents forming an important part of the national cultural to the present.

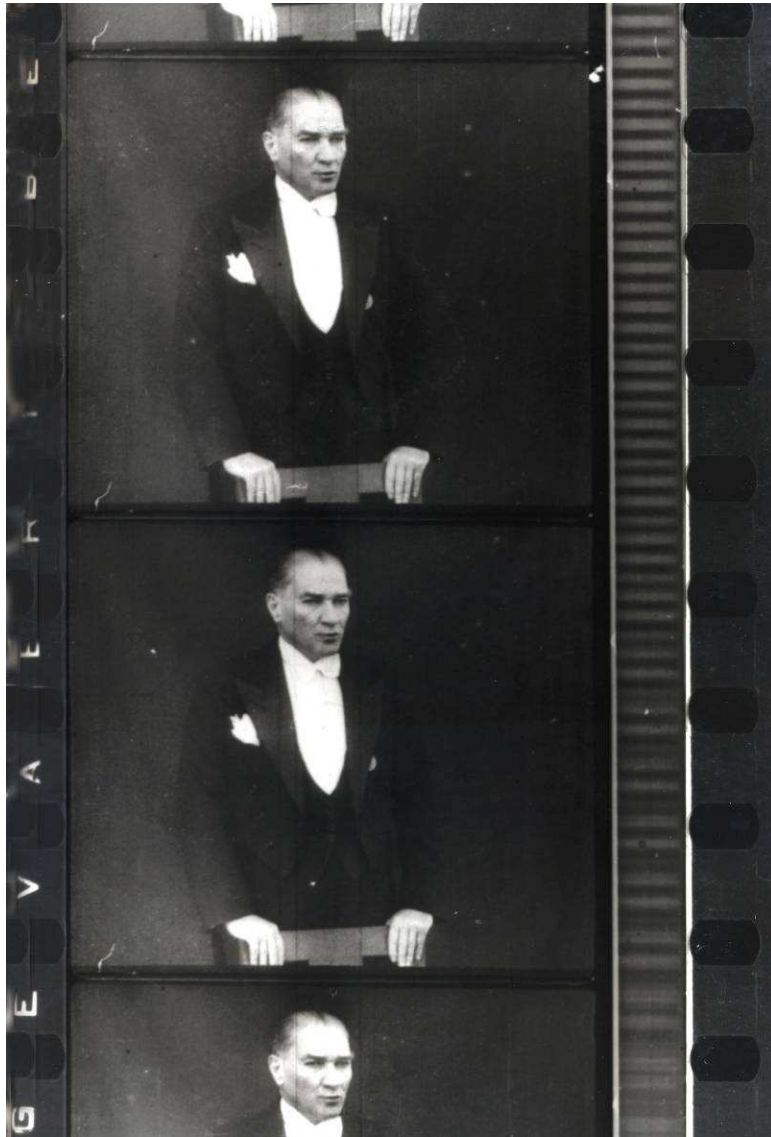
Now, films are featured in not only cinema hall, but also in mass media such as television; are transferred to formats such as DVD, Blu-Ray. The opportunities such as an increase in the number of television channels and transferring of old movies to new technologies increased the interest in this heritage. Diversification of distribution and replication techniques have led to a huge commercial potential and protection of cinematographic heritage has become an important issue that is discussed and studied in terms of technological innovations.

Film archives have struggled with political issues, material deficiencies, while they are protecting cinematographic heritage. Unfortunately, the absence of continuous and consistent government policies is a major problem for film archives. Also problems caused by lack of budget and number of trained personnel constituted serious obstacles to the protection of cinematographic heritage.

Apart from these, at the same time there are problems caused by the chemical properties of the films. The cinematographic works are the technical materials with chemical properties due to its structure, as well as they are work of art. The acid in the structure of the film causes chemical solutions together with a role of the external factors such as heat and moisture in due course. Furthermore, the nitrate-based films have flammable property due to the chemical substances in their structure again. Also the preservation and protection of these films also known as combustible-based has been a major problem and therefore, there has been a lot of fire causing great loss of life and property.

The films, regardless of which material they are manufactured from, become deformed due to their chemical properties even in the event of protection under the best circumstances. Also film archives do restoration works in order to minimize the negative consequences of these impacts on the film material.

The works related to film archival studies carried out in Cinema-TV Center of Mimar Sinan Fine Arts University are performed by the academic staff of the Institution, under the tutelage of our prelector Prof. Sami Sekeroglu, who is the founder of our Institution, starts the film archival studies in our country and is only expert name in our country in many field such as technical, aesthetic, historical of the cinema. Prof. Sami Sekeroglu brought the contemporary cinema technology to our country, used the scientific methods and modern technology for transferring the cinema cultural heritage to the future; trained a staff maintaining this policy. Also this staff that I included carry out all the works in relation to film archival studies voluntarily, as well as training duties, and on the one hand restore and renew our cinematographic heritage, on the other hand train new specialists for this field. A small team consisting of our faculty members and students and working voluntarily maintains the restoration works. These restoration works include historical documents recorded between years 1915-1950. There are Sultan Resat, Sultan Vahdettin's documents, Visits of German and Austrian Emperors to Turkey (The period of Sultan Resat), Documents pertaining to the War of Liberation, Ataturk's Nationwide Tours, Assembly Opening Speeches, Conventions, Bairam Celebrations, King of England 8.Edward, Reza Pahlavi, the Shah of Iran's Visits to Turkey (The period of Ataturk) and Inonu, Bayar, Menderes' documents and also a wide range of military training and exercise film.



One of Atatürk films restored in Cinema-TV Center

All the technological infrastructure used in the restoration works carried out by our Center was established as a result of a long study and with a large investment, and contains the latest innovations in the digital cinema technology. The Ministry of Culture and Tourism and Cinema-TV Center achieved a consensus as a principle for development of the project, by also transferring the important documents to the film. The work continues so as to obtain both digital data at high resolution (4K, 2K, HD) and renovated film outputs.

How to Restore a Film?

The situations of the films are examined for restoration and ones requiring urgency are addressed primarily. Our aim is to eliminate the stain created by the time on the films and to make them nearly their originals. We do not change frame and motions. If required, these can also be done, but we preserve their original status under the terms of FIAF International Federation of Film Archives. The first stage in restoration and renovation works is maintenance and repair processes that are physically made on hand. The films taken out from the cold storage for maintenance are wrapped carefully, their physical defects are detected, all notch fracture, joints, disconnection and torn are repaired one by one on hand by experts in a clean and dust-free place. This work should be done very carefully by a patient expert, because every misapplication will create irreversible failures on the original of the film.



Cinema-TV Center film laboratories. Films are carefully being wrapped and physical defects are being corrected.

The films should be cleaned after maintenance and repair processes. Because even the smallest dust particles on the films seem in big spots when scanning. Therefore, the films maintained and repaired are washed in ultrasonic film cleaning device having a special cleaning solvent before scanning process. The dusts, grease, dirt, fingerprints and other residues are removed on the film by sprayed liquid and film is dried.



Films are being cleaned by a special solvent and being purified from grease and dust.

Since the film material has an organic structure, shrinkage, shrinking and change in size occur on the films in due course, regardless of how healthy the protection conditions. The scanning equipment which allows the transferring the films to digital media at high-quality and high-resolution have claw and gear system. The smallest change in size on the films may result in tearing and breaking of the film during scanning. At the scanning stage, firstly, the nitrate films are kept in the vapor of volatile chemicals in softening containers. However, since the effect is temporary, the film needs to be transferred to digital media as early as possible after scanning.



Moisture and flexibility properties are being brought to films over again.

Transferring to Digital Media

The digital restoration works whose first sample is made in Hollywood, 1995, have reached the current level after the development of software and devices. The major innovations in this field were made in 2009. Also devices we used in our institutions are film scanning and laser printing devices that won technical Oscar in 2010. These devices have specially developed components and software. The films are transferred to digital media after scanning frame by frame in the scanning device. We are performing this scanning process at the highest resolution that is available in the world today, namely in the most advanced quality. The high-resolution digital image information scanned are stored in the data storage unit. The scanning process takes place very slowly. For example, there are approximately 15000 frames on a 10-minute film. The scanning of 15000 frames one by one takes time more than 4 hours.



Films are being transferred to digital media after scanning frame by frame.

Digital Restoration

The image information scanned frame by frame are sent to the data storage center by means of fiber optic cables. From here, they are sent to the digital restoration devices by means of fiber optic cables again. The digital restoration eliminates problems such as all kinds of dust, scratch, missing frame, wobbling and flicker. Even frames which are about to be disappeared are repaired, by taking near tissue from previous or next images. The restoration is a work that is carried out frame by frame and that requires speciality and is very difficult and long-continued. For example, the digital restoration of a 10-minute image may take several months.



Film frames are being repaired, and damages such as scratch and dust are being corrected.

The color and density analysis is performed, by examining each film plan by plan after restoration. The contrast, density and brightness values of the film are corrected. Also the audio restoration is performed, if the film is audible after density process and also this process is added to image information. The film is now ready for digital copy printing.

Transferring onto the Film

The film is not deemed to be recovered after all these processes. Because storing these data in the digital media is not safe. In other words, digitalizing a film is not sufficient for long-term protection. The digital video and audio information may be disappeared at any time, there is no guarantee. Consequently, it is compulsory to transfer documents to the film again for archiving.

Also the opinion of FIAF International Federation of Film Archives that our institution is a member is in this direction.

The image files are transferred onto polyester-based intermediate film. The producing company issues 500-year warranty guarantee for this film. The process of transferring onto the film is carried out, by using a film printer running with laser technology. The film printer transfers the image data onto the unexposed film by using three primary colors. As in the other stages, also this process is very slow. Only print time of a 10-minute short film takes time about 6 hours.

After the process of transferring the digital data onto the film is completed, the main film material that a copy will be produced from is obtained, by washing the film from printer in the laboratories. The negative or positive films are printed from this main material by printing machines. Now, the new copies whose lives are guaranteed have taken place in the archive. Also nitrat-based originals are stored in the rooms that are specially cooled and moisture-protected.



Digital image files are being transferred onto the film over again

The main criterion for ensuring continuity of cinematographic heritage is expertise and experience, as well as awareness and sense of responsibility. Transferring of cinema heritage protected voluntarily by Cinema-TV Center to the future is extremely important in our country. Unfortunately, the importance of perception and protection of cinema products as a cultural heritage could not be understood yet.

The widespread use of digital technology in the cinema; has begun to have an impact on multi-faceted archival applications such as collection, protection, restoration and opening to public of the films. To protect our audio-visual experience forming the strongest bond between our past and future and to transfer them to future generations are under responsibility of principally us, as people trained in this institution and all society feeding on these products.

The digital restoration works that are carried out by the faculty members and students under the tutelage of my prelector Prof.Sami Sekeroglu in Cinema-TV Center in Mimar Sinan Fine Arts University, and that I am proud of taking part in, is a significant change to transferring our national cinema heritage to the future. Another aim is to ensure the formation of need to protect the cinema heritage on younger generations.