Our Archive Symposium, “Large Scale Digitization of Cultural Heritage” was a huge success. Over seventy visitors from around the world, thirty partners and speakers, and ten exhibiting companies joined us at the BBC TV Centre in London UK, October 13th and 14th.

Archive facilities around the world are dealing with a number of challenges when it comes to the correct workflow for their specific needs. Maintaining and preserving a great deal of cultural heritage is becoming a priority for many. During the symposium, archivists from Europe presented their success, and also difficulties with their existing approaches. The Archive Symposium demonstrated a solutions-based approach for preservation and restoration helping archivists accomplish their mission.

We would like to send a heartfelt thanks to our partners that dedicated their time and efforts to make this event a success.

If you were not able to join us for the Archive Symposium we have made all nineteen of the presentations available to you. If you need any further information or would like to download the presentations please visit www.dft-film.com/archive/symposium.php

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In This Issue

- **DFT Archive Symposium “Large Scale Digitization of Cultural Heritage” at BBC, London, Huge Success**
- **A Film Archive Taking on Digital: Article based on Mikko Kuutti’s presentation at the DFT Film Archive Symposium in London 13 October 2011**
- **Cinelicious Awarded “Giants First Steps” 4K Animation Restoration**
- **SCANITY Software 2.0 – News From the DFT Research & Development Team**
- **Digital Agenda: Encouraging Digitisation of EU Culture to Help Boost Growth**
A Film Archive Taking on Digital

January 2008 welcomed the name change of the Finnish Film Archive (founded in 1957) to the National Audiovisual Archive or in Finnish, Kansallinen audiovisuaalinen arkkisto (KAVA). The change was caused by the widened remit into radio and television archiving. Despite the new name, film archiving remains at the heart of the organisation. KAVA also promotes cinema and audiovisual culture in general, including the screening of films of artistic and historical significance. The archive also has a small film museum and exhibitions, and a public library specialising on film and audiovisual. Preserving the Finnish film heritage is a major undertaking, and with a staff of 72 and a budget of 6.8 million €, the archive maintains comprehensive archive collections of domestic and foreign films, video, photographs, and posters.

It is estimated that by the end of 2012, most Nordic countries will have converted all their cinemas to digital technology. What does this mean for film archives? One of the implications of the digital transition is that 35mm print films from archive collections will be unusable in the future. As the presentation format will die. For archives, the presentation format has a much larger impact on the usability of the content. Due in part to this, film archives are looking for the human visual system, the resolution of which is determined by the pixel size of the screen. The human visual system is capable of resolving 10 - 15 lines per degree of visual angle. This means that 4K resolution is required from a viewer’s perspective. How much detail can a cinema patron actually see? If one looks at the requirements of a THX certified cinema, the first row must not have a viewing angle greater than 90° and the last row must not have a viewing angle narrower than 30°, looking at a 2.39:1 Cinemascope image. “Normal vision” is defined as being able to resolve a detail covering 1/60 of a degree, but even a visual acuity of 1/90 of a degree is common. From this you can apply the math that leads to the number of pixels (horizontal and vertical) on a screen that a human can actually discern.

KAVA operates a public database on the internet at elonet.fi providing free access to the filmographic records of the archive. Elonet will also function as the platform for streaming films. KAVA’s first film streaming project has been the European Film Gateway project for which KAVA provided 700 newreels. It is a good example of the pan-European nature of providing access to films. In the digital age, no country is an island.

But viewing films online is only the tip of the iceberg; how does an archive scan the images, store the images, and present them in a cinema or stream them on the web while maintaining high quality and preserving the original viewing experience? The whole chain of digitisation and related activities is a complex one, but in this article we will look mainly at aspects of film scanning. One question that arises is how much resolution is required from a viewer’s perspective? How much detail can a cinema patron actually see? If one looks at the requirements of a THX certified cinema, the first row must not have a viewing angle greater than 90° and the last row must not have a viewing angle narrower than 30°, looking at a 2.39:1 Cinemascope image. “Normal vision” is defined as being able to resolve a detail covering 1/60 of a degree, but even a visual acuity of 1/90 of a degree is common. From this you can apply the math that leads to the number of pixels (horizontal and vertical) on a screen that a human can actually discern.

From a seat located half-way between the first and last rows, a person with a human visual acuity of 1/175 can discern approximately 4K horizontal pixels across a Cinemascope image and a little bit less than 2K pixels over the vertical. Seated in the front row, one can see around 9K. It is evident that the human visual system is not a limiting factor in the resolution of a cinema screening.

A Film Archive Taking on Digital

Cinelicious Awarded “Giants First Steps” 4K Animation Restoration

The Academy Film Archive in conjunction with “In Giants Steps” program curator Ron Diamond of Acme Filmworks have awarded Cinelicious the 4K restoration of the important early works of a selection of prolific animation directors including Andrew Stanton, Henry Selick, David Silverman, John Musker, Ron Clements, Eric Goldberg, Kirk Wise, Pete Docter, Mike Mitchell, Brenda Chapman, Kevin Lima, and Chris Sanders.

The diverse collection spanned S8mm, 16mm & 35mm with many film elements including color and bw ORP, OCN, A-B negative, with all films having some form of optical or magnetic soundtrack. Cinelicious was tasked with archival film analysis to determine which elements were best quality for mastering, as well as scanning 16mm & 35mm film and audio elements at 4K resolution from Cinelicious’ SCANTY film scanner. Each film was color graded and restored as necessary at Cinelicious with final deliverables being new release prints done in 4K on a laser film recorder, as well as 4K Master and HD Mezzanine digital files.

In Giants Steps” premiered at the 2011 Annecy Film Festival in France. Keep an eye out for upcoming US screenings of this whimsical, beautiful and inspiring short program.

Cinelicious Awarded “Giants First Steps” 4K Animation Restoration

Another issue to consider are the different aspect ratios throughout the chain. Let’s start by scanning a 1.37:1 cinema aspect ratio image in 4K (4096 x 2990 / 11.7Mpx). If you want to project this image wrapped in a DCP package, you will need to scale it down to fit into the 4K / 1.89:1 container. The result is an image of approximately 2359 x 2160 / 6.1Mpx in size. With digital cinema technology today, this is the highest amount of pixels you can project from an academy format film image onto a screen. If you create a 2K DCP from the 4K scan, the result is a 1440 x 1080 / 1.6Mpx image, which only contains 13% of the spatial information of the original image. This makes a compelling case for producing 4K DCPs from archive films.

The information content of a 35mm film frame and the scanning resolution needed to capture that has been the subject of much debate. It is a complex issue because a grain on a film is a very different kind of picture element than a digital pixel sample. The ITU conducted research into the matter in the early part of the 2000s, and the result was that one can expect to record and retrieve about 2700 vertical lines of detail from a full frame film image. This is equivalent to an information content of just under 4k across the image. 4K can thus be considered to approach the resolution of 35mm film. Any higher resolution scanning will likely yield more detail of the grain but not necessarily of the filmed subject.

Scanning at 4k achieves oversampling (even for 4k digital projection), which helps avoid aliasing, improves spatial transformations like stabilising and...
SCANCITY Software 2.0 – News from the DFT Research & Development Team

The DFT Digital Film Technology R&D team is known in the film industry for being highly dedicated to their craft and they are always looking for improvements that will help customers make the best use of their investment.

SCANCITY Software 2.0 available now includes many updates as well as several new features that enhance SCANCITY.

Below are a few of the updates we have included in SCANCITY Software 2.0:

- Additional aspect ratio formats have been added to better support ‘Academy Camera Aperture’ aspect ratios.

- Rescanning of an image can be triggered quickly by pushing a dedicated button, which makes setting changes visible

- Operational improvement for adjusting light and density more easily and precisely have been included:
  - Values can be manually edited
  - Adjustments in increments of 0.1 are possible to allow a finer adjustment
  - Increasing / decreasing values via a mouse

- 1-Bit Alpha Channel (Dirt Matte) supported for RGB10

- 1-Bit alpha channel dirt matte

- Separate Alpha Channel (Dirt Matte) Image Recording Supported

- With the separate alpha channel dirt matte, scanned images are stored as separate DXP files in a selected folder.

SCANCITY Software 2.0 is a major release that requires a user to set up a new database. Once you have updated your SCANCITY Software to version 2.0, all further minor releases (2.xx) within this major release are free of charge.

Digital Agenda: Encouraging Digitisation of EU Culture to Help Boost Growth

The European Commission has adopted a Recommendation asking EU Member States to step up their efforts, pool their resources and involve the private sector in digitising cultural material. This is essential to make European cultural heritage more widely available and to boost growth in Europe’s creative industries. The digitised material should be made available through Europeana, Europe’s digital library, archive and museum.

The Recommendation challenges Member States to develop solid plans and build partnerships to place 30 million objects in Europeana by 2015 compared to the 19 million available today; to get more in-copyright and out-of-commerce material online; and to adapt national legislation and strategies to ensure the long-term preservation of digital materials.

The Recommendation invites Member States to:

- Put in place solid plans for their investments in digitisation and foster public-private partnerships to share the cost of digitisation.

- Make 30 million objects available through Europeana by 2015, including all Europe’s masterpieces which are no longer protected by copyright, and all material digitised with public funding.

- Get more in-copyright material online, by, for example, creating the legal framework conditions enabling large-scale digitisation and cross-border accessibility of out-of-commerce works.

- Reinforce their strategies and adapt their legislation to ensure the long-term preservation of digital material by, for example, ensuring the material deposited is not protected by technical measures that impede librarians from preserving it.

Useful links:


Europeana, Europe’s digital library, archive and museum: http://www.europaeana.eu

Digital Agenda website: http://ec.europa.eu/digital-agenda

Nelleke Kroes’ website: http://ec.europa.eu/commission_2010-2014/kroes

Mikko Kuutti

Mikko Kuutti is Deputy Director at the National Audiovisual Archive in Helsinki. He has a background in architecture and film post production, and has been in his current position in charge of the collections at the archive since 2001. He is an associate member of the International Federation of Film Archive’s (FIAT) Technical Commission and is a member of the Executive Committee of the association of European Film Archives (ACE).

Needle Kroes, Commission Vice-President for the Digital Agenda said: “Europe has probably the world’s greatest cultural heritage. It cannot afford to miss the opportunities offered by digitisation and hence face cultural decline. Digitisation brings culture into people’s homes and is a valuable resource for education, tourism games, animation and the whole creative industry. Investing in digitisation will create new companies and generate new jobs.”

Europeana, which started out with 2 million objects when it was launched in 2008, currently holds more than 19 million objects, which are now accessible through a more intuitive and interactive interface. In order to provide a more balanced set of contributions from across Europe, the Recommendation sets targets per Member State for minimum content contribution by 2015.

The Recommendation builds on the recommendations of the Comité des Sages (high level reflection group) on bringing Europe’s cultural heritage online, established in 2010.

Adoption of measures to support cultural and creative industries and ensuring a sustainable model for financing Europeana are among the goals of the Digital Agenda for Europe.

Background

Bringing the EU’s cultural heritage online means that citizens throughout Europe can access and use it for leisure, studies or work at any time. Once digitised, material can also be useful for commercial and non-commercial purposes, such as developing learning and educational content, documentaries or tourism applications. This will give enormous economic opportunities to Europe’s creative industries, which currently account for 3.3% of the EU’s GDP and 3% of jobs in the EU.

The new Recommendation updates a 2006 Recommendation in. It takes account of Member States’ progress reports from 2008 and 2010, which show that although there has been some improvement, more action is needed as regards financial resources, quantitative targets for digitisation and solid support for Europeana.