

# Archive NEWS

## DFT Archive Symposium “Large Scale Digitization of Cultural Heritage” at BBC, London, Huge Success



**70 Guests and 19 Speakers Listening**



**Our Host Clive Hodge**

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.



**Stefan Krämper, Managing Director DFT**

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](http://www.dft-film.com/archive/symposium.php)



**Michael Senge SCANITY Presentation**



**Pietro Troilo Demonstrating FLEXXITY**

### 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**

[Read More](#)

**Cinelicious Awarded “Giants First Steps” 4K Animation Restoration**

[Read More](#)

**SCANITY Software 2.0 – News From the DFT Research & Development Team**

[Read More](#)

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

[Read More](#)



# A Film Archive Taking on Digital

Article based on Mikko Kuutti's presentation at the DFT Film Archive Symposium in London  
13 October 2011

January 2008 welcomed the name change of the Finnish Film Archive (founded in 1957) to the National Audiovisual Archive or in Finnish, Kansallinen audiovisuaalinen arkisto (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 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 printfilms from archive collections will be unusable in most cinemas. Film as an everyday medium for both an acquisition and a

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 safe and practical methods for long-term digital preservation and archiving. With developments under way that trend toward IT-based infrastructures, as well as the strong demand for online access of archived content, most film archives are faced with huge transformations. Traditionally, film archives have been havens of slow and steady work around preserving cultural heritage on a stable medium. Soon, they will have to become IT-warehouses doing heavy datalifting in a fast moving technological landscape.

On the European and national levels, there is a growing demand for access to moving images. Europeana is being actively developed into the portal for European cultural heritage including film, and moving images is the type of content most wanted by users. The main hurdle to overcome is copyright. Even works of unknown authors, so-called orphan works, cannot be legally distributed. This and other questions around copyright are active discussion topics in Europe. KAVA's brute-force approach this year

has been to acquire the rights to a large number of short and feature films: more than 400 feature films and thousands of short titles have been purchased. These complement the previously existing rights to some 20 feature films, extensive short and newsreel collections and the whole of the Defence Forces film collection. By having the rights the complex issues around clearing the films for various uses is solved.

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 newsreels. 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 36°, 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°/75 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.

pixel count of a 2.39:1 image		
for human visual acuity of 1°/75	horizontal	vertical
36° (back)	2792	1168
<b>52° (middle)</b>	<b>4192</b>	<b>1754</b>
90° (front)	8594	3596

Another issue to consider are the different



Mikko Kuutti Presentation on the Archive Symposium

aspect ratios throughout the chain. Let's start by scanning a 1.37:1 academy 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 2959 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

## Cinelicious Awarded "Giants First Steps" 4K Animation Restoration

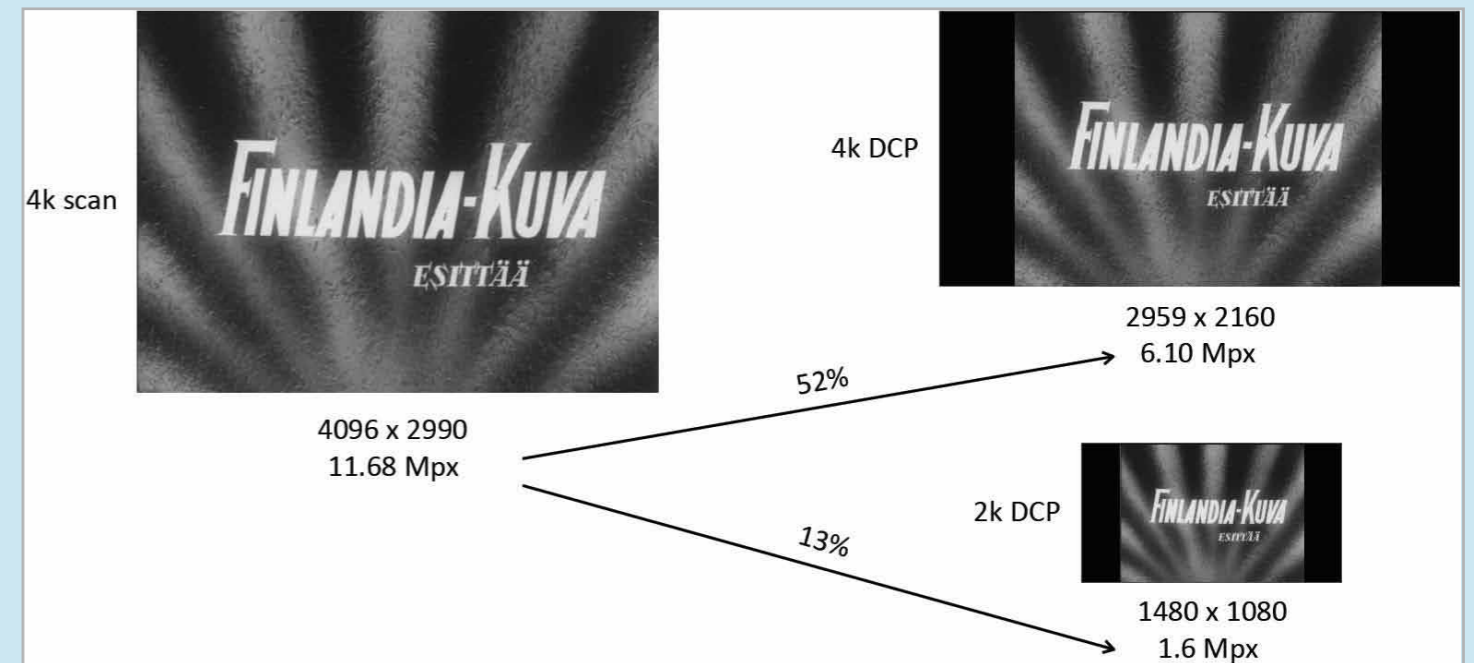
The Academy Film Archive in conjunction with "In Giants Steps" program curator Ron Diamond of Acme Filmworks have awarded Cinelicious the 4K restoration of the important early works of a selection of prolific animation directors including Andrew Stanton, Henry Selick, David Silverman, John Musker, Ron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

The diverse collection spanned 8mm, 16mm & 35mm with many film elements including color and b/w 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' SCANITY 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. [www.cinelicious.tv](http://www.cinelicious.tv)



Scanning in 4K to Preserve High Enough Resolution for 4:3 Content

dewarping – helping in general to reach higher final image sharpness compared to scanning at screening resolution. High scanning resolution also improves results for dust busting and scratch removal during a film restoration process. 2K scanning can be considered ‘good enough’ for some purposes, but does not offer the best results. However, 2K does save a lot of time and resources (bandwidth, storage, and processing time) compared to 4K scanning.

Scanning time is also a key consideration during the archival & restoration process. About 120 Finnish feature films from the National Film Archive are lent out per year, and they will soon all have to be in the form of a DCP. Physical film preparation, film scanning, colour correction, sound scanning, sound syncing, file packaging and compression, and file transfer all takes time. KAVA's optimistic estimate for this is one day spent scanning, and three days spent finishing up the other work to prepare files for digital distribution and access. It is quite evident that there aren't enough working days in a year to spend even four days digitising and processing per film. Therefore, the scanning equipment must be powerful and fast enough to not impose its own

restrictions for the overall processing schedule. In a high-volume scanning scenario, there simply is no place for a scanner taking multiple days to scan a feature film. The 15fps at 4k resolution SCANITY was the only scanner on the market that KAVA could even consider.

KAVA's objective is to build a fluid DCP production pipeline, whereby feature films are scanned in 4K, while newsreels and short films can optionally be scanned at 2K. Audio will be scanned directly from the negatives if they exist. To accomplish this, KAVA is supplementing the SCANITY 4K with a SoundDirect laser sound scanner, a Resolve colour corrector and Revival restoration systems from Blackmagic Design, and Curator software from Fraunhofer IIS for DCP production. The systems share a fibre channel SAN, and are interconnected via a 10 Gigabit Ethernet network, which also gives access to offsite longterm storage with tape archives. Refinements and additions to the workflow are still going on, and are expected to continue. Film is an organic medium requiring little attention – digital file workflows are inorganic entities forming a live organism requiring constant attention. Film archives will just have to adapt.



**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 Archives (FIAP) Technical Commission and is a member of the Executive Committee of the association of European Film Archives (ACE).*

## SCANITY Software 2.0 – News from the DFT Research & Development Team

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

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

Below are a few of the updates we have included in SCANITY 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

SCANITY Software 2.0 New Features:



**Extended Functionality to Further Support Archive Applications**

- Archive Modes
  - A new Archive Tab has been added to the Ingest Page gathering all the various existing and new settings that are relevant in Archive Application
  - New controls allows the SCANITY operator to select the film transport speed, acceleration, and tension. This provides

added special treatment to extremely delicate films.

- In the unlikely event that film slippage occurs, the acceleration and maximum possible speed is automatically reduced
- 1-Bit Alpha Channel (Dirt Matte) Supported for RGB10
  - RGB10 file formats now can be selected to include a 1-bit alpha channel dirt matte.
  - This supports additional restoration tools (e.g. PF Clean by Pixel Farm)
- Separate Alpha Channel (Dirt Matte) Image Recording Supported
  - With the separate alpha channel dirt matte, scanned images are stored as separate DPX files in a selected folder.

SCANITY Software 2.0 is a major release that requires a user to set up a new database. Once you have updated your SCANITY 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 (see [www.europeana.eu](http://www.europeana.eu)).

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.



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 conclusions 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.

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. The Recommendation spells out key principles to ensure that such partnerships are fair and balanced.
- 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:

Recommendation on the digitalisation of cultural material and its preservation on line: [http://ec.europa.eu/information\\_society/activities/digital\\_libraries/index\\_en.htm](http://ec.europa.eu/information_society/activities/digital_libraries/index_en.htm)  
Europeana, Europe's digital library, archive and museum: <http://www.europeana.eu/portal/>  
Digital Agenda website: <http://ec.europa.eu/digital-agenda>  
Neelie Kroes' website: [http://ec.europa.eu/commission\\_2010-2014/kroes/](http://ec.europa.eu/commission_2010-2014/kroes/)



Neelie 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 items when it was launched in 2008, currently holds more than 19 million objects, which are now accessible through a more