

Digital Photography at SIK-ISEA

MATTHIAS OBERLI

In future, all the photography and image processing at SIK-ISEA will be digital. It is a fitting time, therefore, to look back at the era of analogue photography at our Institute and to look forward to prospects and challenges for the new technology.

At the end of 2010, SIK-ISEA definitively ceased all analogue photographic production and in future it will focus solely on digital photography. One visible sign of this technological transition has been the conversion of the Institute's three dark rooms into new storage space for the archives. Where once our photographers developed films and made black-and-white prints in the glow of red lamps, dossiers are now being filed by our art technology department. The process that began at SIK-ISEA with the new millennium and steadily progressed, with the scanning of analogue images and the production of digital images, has now entered the phase of routine operation and will henceforth be the dominant technology in our documentation of art works.

From black-and-white prints to digital colour space

Taking photographs of art works is one of the core competences of SIK-ISEA. In 1952, only a year after the Institute was founded, the first photographic studio was installed complete with its own lab. From that point on, the Institute carried out extensive photographic campaigns as part of its efforts to compile inventories and documentation of art in Switzerland, either in its own studio or in situ – in museums, private collections and the public realm. For forty years, from 1965 to 2005, this responsibility rested in the hands of our photographer Jean-Pierre Kuhn. It was his successor, Lutz Hartmann, who initiated the digital transition over the last five years. Since the summer of 2010, Philipp Hitz has been SIK-ISEA's specialist in digital photography.

Until the 1970s, most of the pictures we took of art works were done in black-and-white using film in the large and medium formats. Increasingly, the Institute turned to large formats on colour film for transparencies (4x5 inch Ektachrome slides), and until

recently this remained the standard material for our photographs. Deposited in SIK-ISEA's image archives, we have not only the negatives and the black-and-white prints made from them, but also the 5x4" Ektachrome and small-format slides. They amount to approximately 100,000 items of photography and constitute the basis for diverse research and publication projects carried out at the Institute. With Simonetta Nosedà as academic manager and Alice Jaeckel at the administrative helm, frequent use is made of our image archives – a unique resource for anyone with an interest in artistic activity in Switzerland – by visitors from outside, such as museums, publishing houses and scholars.

From the early 1990s, SIK-ISEA cherished a vision of gradually integrating this photographic stock into the Institute's database and enabling users to access the image archive from anywhere via computer. For a long time, however, the high cost of professional digitisation rendered this largely impossible. There was a need, furthermore, to establish a single quality standard for digital reproductions and a process for working with digital stock that would be observed by all departments. To that end, a position was created in 2001 for someone who would take responsibility for digital image processing. Andrea Reisner, who held a degree in media design, was entrusted with setting up this new service and taking it forward. The image processing team at SIK-ISEA now comprises two positions, with Regula Blass working alongside the head of unit. At the same time, our Institute was able to gain experience in working professionally with digitised publications, thanks to our partnerships with Fotosatz Schmidt & Co., a firm based in the German town of Weinstadt who assumed the task, among other things, of scanning all the photographs for the *catalogue raisonné* of Ferdinand Hodler, and with Südostschweiz Presse und Print AG in Chur, who have printed many publications for SIK-ISEA and are also digitising major sections of our Image Archive.

One of most important conditions to be met when standardising an approach to digital stock is to establish a binding colour space that will guide everyone concerned (photographers, processors, printers). Defining the colour space is key to ensuring that a digital image will vary as little as possible between one piece of equipment and the next, retaining its colour as accurately as possible and always remaining colour-proof when digital image data are transferred. Screens, digital cameras, beamers and scanners work like the human eye, applying an additive model which builds up colour by combining red, green and blue [RGB]. This RGB process is particularly helpful when converting image data for viewing on screens or for publishing online. Printing, on the other hand, works with a subtractive four-colour process based on the primary colours cyan, magenta, yellow and black [CMYK].

As SIK-ISEA publishes its images online (for example, on the Institute's website www.sik-isea.ch and on www.sikart.ch) as well as in book form, all digital photographs at the Institute are processed using the RGB colour space. To avoid changes in the perception of different colours, the screens used for image processing and photography are calibrated regularly and images on the screen are compared with originals under constant light conditions. This is one of the decisive advantages offered by digital photography compared with the analogue technique: the time-consuming task of developing films is no longer required and the image can then be compared directly with the object taken and if necessary corrected or repeated. This opportunity for immediate review and adjustment allows us to perfect specific photographic methods for very different works of art, be they oil paintings with their reflective varnish and dark patches, finely structured drawings and watercolours, or sculptures which cast shadows. This is all the more valuable given that we often have only one chance – if, for example, working in the field at private collections or exhibitions – to capture poorly accessible objects of art.





Data formats and data preservation

In the spring of 2009, SIK-ISEA invested considerable financial resources of its own, boosted by a grant from the Vontobel Foundation, in a high-definition digital camera, a Hasselblad H3DII-39MS offering a resolution of 39 million pixels and multi-shot technology, along with the associated technical equipment, including colour-proof screen, desktop station, laptop for field work and mobile workbench. Following a detailed test and implementation stage, assisted by Zurich-based photographers Light + Byte, the various stages in the work flow from photography via image processing to archiving have now been aligned and the conditions for obtaining artwork photography of outstanding quality have been optimised.

The multi-shot technology provided by the Hasselblad camera means that four computer-controlled shots of an object can be taken in rapid succession, with the camera's sensor shifting each time by a single pixel. This obtains the maximum possible colour data for each individual pixel. Photography based on this principle generates images which boast captivating definition and optimum colour reproduction. It should, however, be remembered that this creates a huge volume of data, because a single multi-shot image usually amounts to more than 200 megabytes. If this raw data is to be processed by the usual software for various print and online applications, it is first compressed to around 80 megabytes and converted into a TIFF (tagged image file format). This digital image file is then recomputed during image processing into formats for other applications (such as JPEGs, which lend themselves to Web presentation) and integrated into the database.

One of the great challenges of digital photography and image processing lies in the long-term archiving of the stock. Black-and-white negatives can still be used to make new prints after almost a century. In Ektachrome and small-format slides, on the other hand, colours alter noticeably after a few decades due to chemical reactions, which means that they are no longer colour-proof. Inevitably, as digital photography is a new medium, not much experience has been gained so far with fluctuations in data. All we know is that a CD-ROM lasts for about ten years. After this, the data in its memory is often hard to read, if not altogether unreadable. Digital image data must therefore be stored on permanent carriers such as hard drives, frequently checked for possible data losses and migrated at regular intervals to new storage media. At the same time, the image data must continually be translated into new program formats so that it is still fit for application.

During the last decade, SIK-ISEA has acquired substantial expertise in the digital reproduction of art and the proper post-processing and archiving of the data. These services are now being taken up both by Swiss museums and by private individuals and artists who want to see their works reproduced to the highest quality standards.