

VISUAL IM/MEDIACY: TOWARDS A CULTURAL TECHNOLOGY OF IMAGES

[= related to lecture on occasion of the conference METADATING THE IMAGE, organised by Lev Manovich, festival DEAF 03, Rotterdam]

Meta-dating *Laocoon*

<...>

Beyond culture?

Meta-dating *Laocoon*

"Will our visual culture be still dominated by photographic-like images in the twenty first century, or will other kinds of images, genuinely computer-generated, eventually take their place?" (Manovich). Instead of subjecting images to the alphabetic and verbal description any longer, the alpha-numerical regime generates words, images and sounds in the same binary code and enables unprecedented types of (no longer "re"-)presentations.

Due to mighty computational algorithms, it is, by now, possible to navigate through large amounts of sound and image files beyond verbal language, opening an im-mediate access to the so-called "audio-visual", unfiltered by words.

Let me start with a *rendez-vous* between two men - one made from stone, one from flesh - in 18th century Rome.

Here the antiquarian Johann Joachim Winckelmann, the god-father of modern archaeology and art history, was confronted with his adored master-piece of ancient sculpture, the famous *Apollo* at the court of the Belvedere in the Papal Vatican.

Immediately, Winckelmann turned his visual, sensual experience into a literary description, that is, by changing the channel to describe his meta-physical perception. Since then, next generations knew the *Apollo* rather from Winckelmann's famous description than from visual evidence.

Even more meta-dating the image was the art critic Gotthold Ephraim Lessing: Having written his famous essay on the ancient sculpture of the dying Trojan priest *Laocoon* in 1766 (which you see next to *Apollo* on the slide as well), he did not even care to see the original when he was in the Roman Vatican years later. On the contrary, he underlined that he was happy with a reproduction in print or engraving - since an engraving is already a meta-information on the visual original.

A different form of figurative description was performed by William Blake, commissioned to engrave the *Laocoon* in 1815.

Blake produced an engraving „which he filled with aphorisms and observations, sideways, round the figures, and in almost every

empty space."¹ Thus meta-description literally subjects the visual evidence.

Most radical is Sandrart's measuring of *Laocoon*, turning the image into calculable numbers.

The police is not yet able to register the characteristics of a human face that remain the same, in youth and old age, in happiness and in sorrow. <...> And because the police does not know what it is, how to describe the picture of a human being, the police wants at least to take measurements of it, to express its picture in numbers. <discourse: 88>

Expressing pictures by numbers thought undoes the old dichotomy between image and meta-data; there is rather an imposition of images and numbers in digital space.

Enters the computability of images, which derives ultimately from Albrecht Dürers and the renaissance perspective artists scale pictures (the rules of projective geometry). „This precedes depiction by photographic means" and makes it, reversely, possible to calculate for machines pictures out of numbers and rules <discourse 88f>, as being accentuated by the late media philosopher Vilém Flusser:

Digital technology is already found in embryonic form in photography, because the photographic images is built up out of points and decomposes into points. The human eye synthesizes the points into an image. A machine can capture the same image, without any consciousness or experience of the form, by situating the image points in a coordinate system. The continuous sign-system image thereby becomes divisible into „discrete" units; it can be transmitted and reproduced. A code is thus obtained that comprehends images. This leads one to activate the code and to create new images out of the code language.²

But at what level is an image an image at all?

What is an image: a set of data, a format, an „epistemological thing" (according to Jörg Rheinberger)? And at what moment is an image an image? By human perception, by verbal description (*ekphrasis*) only, or independent from human awareness already? Without human interpretation of certain visual patterns, the image would just be a cluster of data. Optical signals become information „in the eye of the beholder" only, while the computer can deal with the symbolical analysis of physical data only, not with the imaginary.

¹ William Blake's Writings, ed. G. E. Bentley, Jr., I (Engraved and Etched Writings), Oxford, 1978, 743f.

² Harun Farocki, *Reality Would Have to Begin*, transl. Marek Wieczorek / Thomas Keenan / Thomas Y. Levin, in: *Documents* 1/2 (Fall / Winter 1992), 136-146 (142), here referring to: Vilém Flusser, *Für eine Philosophie der Fotografie*, Göttingen (European Photography) 1984 (Towards a Philosophy of Photography)

What digital space allows for, though, is the option of navigating images in their own medium

- without changing the channel, from visual to verbal language (according to Raymond Bellour). In digital space, the task of *searching images* does not only mean searching for images, but has a second, reverse meaning as well: images that are capable of searching for similar images, without the interception of words. Navigating in *Dataland* (as designed in 1973 by William Donelson), not in the alphabet.

When Chris Marker, in a reflections of his film *Sans Soleil*, tried to remember a January he once spent in Tokyo, he realized that he rather remembered the images he then filmed there - images which had replaced his organic memory (). Thus all of the sudden, and re-activating the ancient and Renaissance *art of memory*, images themselves become meta-data of memory - *searching images* in the active sense.

„Surprisingly little energy has been spend so far thinking on how we interface to images“ in a non-verbal way (Lev Manovich). Let us thus search for visual knowledge not by meta-dating images, but within the visual endo-data: entering the image itself (data-immersion).

[In return, information about information generates a kind of second-order visual knowledge, cartography, diagrams - infomapping.]

A critique of the notion of „meta-data“ draws on the assumption that there is knowledge already within the images, a kind of knowledge which either does not need to be meta-dated or cannot be grasped by verbal description at all. Let us call it - analogous to xxx Rösler's notion on *endophysics* - *endo-data*.

Let the image be informative itself - by means of operating with values that are, already, intrinsic to the image in a digital culture when the essence of the image itself dissolves into alphanumerical, bit-mapped data.

„We can tease out some indications of image structure and semantics (for instance, we can find all edges in a bit-mapped image)“ (Lev Manovich).

[But a „digital image“ is an image no more; what looks like images, is rather a function of mathematical data sets.]

My thesis is: there is a knowledge already implicit, „dormant“

within the electronic images, a kind of compressed virtual knowledge, which - different from external inscriptions (meta-data) - waits to be un-covered from within.

Digitalen daten-banks, when cleverly adressed, render a kind of knowledge to us which would otherwise be unimaginable in the Gutenberg printed information culture. That is, digital images render aspects of visual knowledge which only the *medium knows*, virtually in the „unconscious“ of the daten-bank. The media-archaeological program is to uncover such *virtual visual knowledge*.

Photo und System: IMAGO, Fischli / Weiss

Images have a kind of internal knowledge³ which cannot easily be meta-dated verbally. Searching for the ornaments on a carpet for example, or for the colorit of a tapestry, the user of ICONCLASS would fail, since here he can only find what has been indexed by the cataloguer. In a rivalling picture data bank called IMAGO developed by a software company in Hamburg together with art historians in Berlin at least a „hyperlink module“ allows, by *drag and drop*, to create non-verbal, rather diagrammatic relations between single subjects and text parts - just like Vannevar Bush's 1945 design of a mechanical *Memory Extender*, microfilm-based on „selection by association, rather than by indexing“.

Once "automated", a visual flow can be machinically implemented.

Like in minimal music, Fischli and Weiss present a series of images with almost unrecognisable (for humans at least) differential repetitions (phasing). What looks similar to us, is indeed very different by close reading.

A visual archive of cinematographical topoi: Navigating images on the borderline of digital addressability

But in most media archives, navigation through images still requires verbal or alphabetical meta-dating.

Addressing and sorting non-scriptural media remains an urgent challenge which, since the arrival of fast-processing computers, can be met by digitizing analogue source material. The result is not necessarily better image quality but, rather, the unforeseenability to address not just images (by frames) but every single picture element (each pixel) - just like

our body has become a genetic archive, now that it has been

³ See xxx Mitchell, *What do Images Know?*, xxx, as referred to in: Ina Blom, *Autobiography of Video*, Sternberg Pr. 2016

digitally opened up in the Human Genome Project.

Images and sounds have become calculable and thus capable of being exposed to pattern-recognition algorithms. The notion of „pattern“, after all, is derived from Latin *pater* - no matrix but rather a *patris*, a patri-archival order (as described by Derrida in his book *Archival Fever*). Such procedures will not only media-archaeologically "excavate" but as well *generate* unexpected optical statements and perspectives from an audio-visual archive that can, for the first time, organize itself not just according to meta-data but according to its proper criteria - visual memory in its own medium (endogenic).

Contrary to traditional semantic or iconological research in the history of ideas, such an endogenic visual archive will no longer list images and sequences according to their authors, subject, and time and space of recording. Instead, digital image data banks will allow visual sequences to be systematized according to genuinely iconic notions and mediatic rather than narrative common-places (*topoi*), revealing new insights into their im/material values. Our predominantly scripturally-directed culture still lacks the competence of genuinely visual communication.

The writer Arno Schmidt already dreamt of a visual note box that would make it possible for him to communicate with a memory apparatus without virtual interference.⁴

Visual archiving: Sorting and storing images

Let me continue by playing, a bit (literally bit by bit, or rather pixel by pixel), with signifiers: Visual archiving is all about both *sorting* und *storing* images - the archival question of the DEAF03 symposion combined with the subject of the *Metadating Images* panel.

Cultural memory of images has traditionally linked images with texts, terms and verbal indexes. Confronted with the conversion of images into digital storage gradually non-verbal methods of classification gain importance. It is not the archival question which poses a problem to visual memory; rather the search methods used to find pictorial information are still limited to models which have been developed for retrieving texts:

Typically, available methods depend on file Ids, keywords, or text associated with the images. <...> they don't allow queries based directly on the visual properties of the images, are dependent on the particular vocabulary used. <Flickner et al. 1997: 7>

⁴ Compare Niklas Luhmann, *Kommunikation mit Zettelkästen*, in: xxx

Techno-image archaeology⁵ aims at rethinking the notion of images from the vantage point of the process of digital archiving. The archive here is seen as a form of organization of all that can be addressed as information - in so far they determine as well what is allowed to be forgotten.

Cybernetically, an archive is a coupling of storage media, formats of contents and address structures. In this case the images is to be conceived as data format. Methodologically this implies leaving behind the contemplation and description of single images in favour of an investigation of sets of images.

In his 1766 essay *Laocoon or the Limits of Painting and Poetry* G. E. Lessing discussed the aesthetic conflict between the logic of language and the logic of images in terms of a genuinely multi-media semiotics: painting (*pictura*) is no longer - as declared by Horace - like poetry (*ut poiesis*); time-based media (like dramatic speech and linear narratives) differ from space-based media (like simultaneous two-dimensional pictures). The digitalization of images today provides a technical basis of inquiry into this conflict in terms of the medium computer. How can archives be related to algorithms of image processing, of pattern recognition and computer graphics? Wavelets instead of Fourier analysis?

Paradoxically speaking, meta-dating makes us *deaf* towards images. Western cultural competence and technology of finding, transferring und processing stored images has been marked by the supremacy of the word as instrument and medium of control and of navigation, such as catchword translation of image contents and the titling of authors and works - a practice which the media-philosopher Vilém Flusser calls „Iconoclasm“. Iconography is the essence of a text-based grip on images (comparable to Optical Character Recognition), trying to reduce the informational richness of an image to the clarity of verbal semantics.

In sharp contrast to iconography the media-archaeological investigation of image archives do not take images as carriers of verbally expressable meanings. Image processing by computers can no more be re-enacted with the anthropological semantics of the human eye. The starting point is rather a theory based on Michel Foucault's discourse analysis and Claude Shannon's mathematical theory of communication, as well as practices and notions of data-structure-oriented programming. A meta-data-free visual memory leads to intuitive visual archives: *modelling* similarity without verbal annotation; instead: query by visual (ex)sample, automatic feature extraction. This model does not replicate human behaviour but media-archaeologically performs data mining. Just throw an image into the computer and see how the computer, orders it - which, finally, might teach humans to take the perspective of computer perception (for a moment at least).

⁵ On technical images and the notion of the techno-imaginary, see: Vilem Flusser, *Kommunikologie*, ed. Stefan Bollmann / Edith Flusser, Frankfurt/M. (Fischer) 1998

After all, why should we always try to force the semantic criteria of human image understanding upon the computer? On the contrary, the entirely different criteria of image similarity in computing may lead to unexpected insights in visual culture. Beyond meta-dating, we now longer force a foreign medium (texts) upon images, but approach them in their own mediality - an interfacing-aesthetics based on the difference between human and machine (Georg Trogemann).

The hunger for visual knowledge in the - literally - age of enlightenment led to visual encyclopedias in the eighteenth century already (like the *planches*, i. e. the visual supplement of the big French *Encyclopédie* edited by Diderot and d'Alambert). Photography then has been the switching medium from printed images to technology, creating the first technical image archives.

Without meta-data, thought, the human mind gets lost within the imaginary museum of photographic pools:

Abb.: André Malraux selecting photographic black & white reproductions of works of art for his *musée imaginaire*, ca. 1947

The alternative to the photographic encyclopedia is visual sampling (Harun Farocki).

When it comes to programming digital data bases, priority should be given to the development of a *visually* adressable image archive by the application of de-ferring algorithms creating different visual sequences and neighbourhoods (the digital *différance*). Operators of image processing and pattern recognition such as filters and invariant transformations can be integrated in the structure of the data-base in order to make cluster of images accessible by pixel data within, not outside the pictures. Let us have a look at such an image-based image retrieval program developed by the VIPER group at Geneva:

online-Demo <http://viper.unige.ch/demo/php/demo.php>

Navigating the visual archive

In traditional museums and other kinds of image collections, not the images, just their alphanumerical meta-data belonged to the realm of the archive. There are two divergent, even conflicting archival info-aesthetics:

In den meisten Computern liegt Material bei einer „Adresse“ gespeichert:

Retrieval is possible only by addressing the image data by an index - *via* an archival register, *meta-data*.

Moving image retrieval

Instead of endlessly re-arrangable photographic image collections, movies themselves have become the image archives in media culture, ruling image sequences both conceptually (*montage*) and consequentially.

Within the medium film, the practice of montage (*cutting*) has always already performed an kind of image-based image sorting (by similarity, f. e.). Cutting has two options: to link images by similarity or by contrast (Eisenstein's option). Only video - as a kind of intermediary medium between classical cinema and the digital image - has replaces mechanical addressing of cinematographic images by different means (*timecode*), offering new options of navigating in stored image space. Automated digital linking of images by similarity, though, creates rather unexpected, improbable links: which are, in the theory of information, the most informative, the least redundant ones. It also allows for searching for the least probable cuts.

What happens if that sequence is not being arranged according to iconological or narrative codes any more, but rather in an inherently similarity-based mode, leading to a genuinely (image-oder media-)archaeological montage?

Every film camera shot is already a sequence of images (photographic frames) which, until the cut, is characterized by image similarity. If an image (frame) is thrown into the digitized film images pool, a program (Heidenreich) is able to contextually detect the most probable shot it is derived from. Once large quantities of film have been archived, such an automatized query will uncover patterns of similarity which human, that is: iconologically-centered image perception (imagination) would not even conceive of - an archive of *signifying* (not signified) *topoi* such as colour distribution patterns and histograms which are not being externally defined by man (by meta-dating), but inherently by the digital nature of the scanned images themselves, that is: my media-archaeological self-awareness.

Different from the verbal space there is still an active visual thesaurus and grammar of linking images lacking; our predominantly scripturally directed culture still lacks the competence of genuinely filmic communication („reading“ and understanding).

Genuinely mediatic criteria for storing electronic or filmic images have been listed by the director of the Federal Archives of Germany (Kahlenberg) and the chief archivist of the nationwide public tv-channel ZDF (Schmitt); next to economically driven criteria (recycling of registered emissions) historically- semantically-iconographically „inhaltsbezogene Kriterien“ they

name 1. „Dominanzereignisse“ (historical event-centered), 2. „politische und soziale Indikationen längerfristiger Entwicklungen und Tendenzen“, 3. „Soziale Realität im Alltag“ follows under „gestaltungsbezogene bzw. ästhetische Kriterien“ 1. „Optische Besonderheiten“ (remarkable camera perspectives, such as „Bildverkantung und extreme Auf- oder Untersicht“), 2. „die dramaturgische Gestaltung von Bildsequenzen“ (cut, opposition of single frames), 3. „besondere Bildmotive“ (landscapes, people) – close to Farocki's *topoi*. Last but not least, of course, „Medientypische Gesichtspunkte“ – the very proper media archives, documenting the history of a tv channel itself.

On the market, though, digital video browsing still seeks to reaffirm textual notions such as the story format as segmentation of a video sequence, such as the news story, „a series of related scenes with a common content. The system needs to determine the beginning and ending of an individual news story.“⁶ Beginning and end though, in technical terms, are nothing but cuts here.

With film, time enters the pictorial archive. Once being digitized, even the single frame is no more a static photographic image, but a virtual object which is constantly being re-inscribed on the computer monitor in electronic refresh circle light beams. While the visual archive has for the longest time in history been an institution associated with unchangeable content, the memory of (time-based) images becomes dynamic itself. Thus, images get a temporal index.

The equivalent for iconographic studies of images is the search for macroscopic time objects in moving images, „for instance larger sequences constituting a narrative unit“⁷. The media-archaeological look on film, on the contrary, segments serially.

„Current video processing technologies reduce the volume of information by transforming the dynamic medium of video into the static medium of images“; that is, a video stream is segmented and a representative image is extracted⁸ – exactly what indexing by words (description) does.

Retrieval and browsing require that the source material first be effectively *indexed*. While most previous research in indexing has been text-based (Davis 1993, Rowe et al. 1994), content based indexing of video with visual features is still a research problem. Visual features can be divided into two levels <vgl. Erwin Panofskys drei ikonologische Bildschichten>: low-level image features <radikale Oberfläche>, and semantic features base don objects and events. <...>

⁶ Alexander G. Hauptmann / Michael J. Witbrock, *Informedia: News-on-Demand Multimedia Information Acquisition and Retrieval*, in: Mark T. Maybury (ed.), *Intelligent multimedia information retrieval*, Cambridge, Mass. / London (MIT) 1997, 215- 240 (226)

⁷ Philippe Aigrain / Philippe Joly / Véronique Longueville, *Medium Knowledge-Based Macro-Segmentation of Video into Sequences*, in: Maybury 1997: 159-174 (159)

⁸ Atsushi Takeshita / Takafumi Inoue / Kazuo Tanaka, *Topic-based Multimedia Structuring*, in: Maybury 1997: 259- 280 (259)

a viable solution seems to be to index representative key-frames (O'Connor 1991) extracted from the video sources.⁹

But what is „representative“, in that archivo-archaeological context? „Key frames utilize only spatial information and ignore the temporal nature of a video to a large extent“ <Zhang et al. 1997: 149> - which is exactly the boundary between the iconological and the archaeological gaze, between semantics and statistics, between narrative and formal tropes.

Would a visual dictionary still follow the print-model of alphabetic, lexicological order? Do we have to always group image features into meaningful objects and attach semantic descriptions to scenes, or does it rather make sense to concentrate on syntax, thus treating semantics as second-order-syntax?

Search & destroy (Videobildmaterial Farocki)

In automated systems, the image is meta-dating itself, automatically; the meta-data are *within* the image.

In a film called *Eye / Machine*, Harun Farocki draws our attention to *operative images* in so-called intelligent weapons which become data-driven by matching images, not by meta-data any more. That is why Farocki does not link the images of his recent film *Reconnaissance and Persecution* by massive verbal commentaries any more, but the self-linking of images itself mirrors the technology which is the subject of his film.

Memory games: A media archaeology of curiosity cabinets

Let us here compare the „electronic search operations and the methods of the *curiosi* of early modern science and antiquarianism“¹⁰. Sammler im 17. Jahrhundert "imposed structure on the apparent disarray of the phenomenal world by searching for 'matches' <...> amongst the otherwise jumbled elements of their study."

Fig.: David Terniers d. J., Erzherzog Leopold Wilhelm in his gallery of paintings in Brssels, ca. 1651

This aesthetics is based on visual rather than verbal patterns:

⁹ Hong Jiang Zhang et al., Video Parsing, Retrieval and Browsing: An Integrated and Content-based Solution, in: Mark T. Maybury (Hg.), Intelligent multimedia information retrieval, Cambridge, Mass. / London (MIT) 1997, 139-158 (140)

¹⁰ Claire Preston, In the Wilderness of Forms: Ideas and Things in Thomas Browne's Cabinets of Curiosity, in: Rhodes / Sawday 2000: 170-183 <abstract, 170>

Dominique du Cange, the sixteenth-century French philologist, <even> suggested (incorrectly) that the words `musaeum' and `mosaic' were cognate. <...> What all the cabinets and their encyclopaedias share is a syntax of resemblance or identity <...>; their patterns are to be read as comparative contingencies or juxtapositions, as a system of potential *matches*.¹¹

Is such a collection of images or objects "a ruined coherence, the `remains of a greater whole' which the collectors might transform into a `sober and well collected heap'?"¹² "The early modern version of field theory and chaos theory is Montaigne's observation that `toutes choses se tiennent par quelque similitude' (similitude binds everything together) and this is where poetry <...> enters the realm of the Renaissance Computers."¹³

We actually enter this realm with a computer program called *2gether1 - Das Mosaik Tool* der Hamburger Firma Games2Play:

This links to the kind of memory games which we all grew up with:

The memory game already performs playfully image-machting by (exact) similarity.

The Warburg paradigm?

The art historian Aby Warburg, between the two World Wars, made an attempt at a serious memory game. He assembled an *encyclopedia* of visual memory (gestures of passion) in the Occident based on photographic reproductions exclusively (though combined with a large library, the famous Warburg Library of Cultural Studies in Hamburg).

Fig.: Aby Warburg's *Mnemosyne Atlas*, ca. 1929, from: Vitus H. Weh, Dokumentationstaumel. Ausstellungskataloge und ihre

¹¹ Claire Preston, *In the Wilderness of Forms: Ideas and Things in Thomas Browne's Cabinets of Curiosity*, in: Neil Rhodes / Jonathan Sawday (eds.), *The Renaissance computer: knowledge technology in the first age of print*, London / New York (Routledge) 2000, 170-183 (174f)

¹² Claire Preston, *In the Wilderness of Forms: Ideas and Things in Thomas Browne's Cabinets of Curiosity*, in: Neil Rhodes / Jonathan Sawday (eds.), *The Renaissance computer: knowledge technology in the first age of print*, London / New York (Routledge) 2000, 170-183 (174), unter Bezug auf: R. Hooke, *Micrographia: or some physiological descriptions of minute bodies made by magnificent glasses*, London 1665, b2r

¹³ Rhodes / Sawday 2000: 13, referring to: Michel de Montaigne, *Oeuvres complètes*, ed. Albert Thibudet / Maurice Rat, Paris (Gallimard) 1962, 1047, and to N. Katherine Hayles, *The Cosmic Web: Scientific Field Models and Literary Strategies in the Twentieth Century*, Ithaca, NY (Cornell UP) 1984

Ordnungssysteme, in: Kunstforum International vol. 155, June/July 2001, 277-282 (279)

- an encyclopedia of visual formulas in occidental art history, a kind of visual sub-conscious of collective cultural memory) what human similarity operations can do (iconographically) - something the computer would never „read together“ (*col-lection*)

Although this project looks primarily iconographic at first glance, its coupling with new digital image-sorting programs opens up genuinely new perspectives - a productive tension between the traditional image-content based approach and a media-archaeological approach which privileges a genuinely data-based method of ordering images

where the reproductions, provided with numbers, can be constantly re-arranged and re-configured. But although Warburg conceived his chart sequentially, even there the *apriori* of this pictorial memory is still the order or the library. The famous Warburg file catalogue (*Zettelkästen*) translates both texts and images in alphanumerical notations - like in digital space - which then allows for hypermedia-like links of visual and verbal information (the definition for hypertext according to Ted Nelson).

When it comes to sorting visual gestures, we think of a medium which Warburg surprisingly did not acknowledge: silent film (until 1928). In early film, there prevailed a sorting of image sequences, by linking of dynamical gestures, while the static textual meta-data (descriptions, dialogues) were interpolated, remaining clearly separated from the visual flow.

With sound-equipped film, language entered the space of the images itself - both technically (sound track attached to the single frames) and perceptually.

Even today, many automated search operations (as for news broadcast archives) are based on the speech recognition of the clippages (searching for key-words uttered by the anchor-men), not genuinely on visual recognition.

Image archives on the threshold of their digital approachability¹⁴

To sum up, the real iconic turn in metadating images is still to come - a visual sorting of images on the threshold of digital image processing and retrieval. While visual and acoustic sources contain types of information and aesthetics a text can never convey, the book or the digital text as a verbal research tool have been much easier to handle comparatively than large amounts

¹⁴ Based on W. E., *An Image Lexicon of Cinematic Topoi. Film on the Threshold of its Digital Approachability*, transl. Andrea Scrima, in: *KW Magazine* 01/01 (2002), 10f

of images and sounds; that is why the library is still the dominating metaphor of cultural memory in the West. Since calculating and storage capacities of computers have increased significantly, they can become active agents in digital image archaeology by functions like „searching images“. Instead of having to meta-date images by words, we can handle the data within the image itself; whole audio-visual archives thus become calculable (at least on the level of pixel or scan values). Images and soundtracks can therefore be made accessible in their own medium, if only perfectly adequate algorithms of shape and pattern recognition are being made available.

By visually statistical operations, things can be made evident which have never been seen before in images. All of the sudden, images can be retrieved in their own properties and right - that is, not only by the grace of the accompanying text. After a century of building up audiovisual archives alternatively to textual libraries, the cultural challenge now is how to approach these archives in a media-appropriate way - analogous to traditional verbal dictionaries, but organized in a non-alphabetical order (authors, subjects) or even dis-order (ergodically). Actually, the mathematician David Mumford has reduces the vocabulary of picture elements (would be pixels?) in Western visual culture down to 23 elements - just like the letters of the (Greek) alphabet.¹⁵ Image-endogenous systems of classification replace meta-dating, such as geometric topologies of image or even cinematographic sequences. Whereas previous image sorting in a primarily writing-based culture has so far been clearly iconologically orientated (see Erwin Panofsky), computing now offers the possibility of applying non-semantically operating image-sorting programs which rather recognizes formats and creates a strictly form-based image assortment (see Heinrich Wölfflin, and Foucault's reading of Manet's paintings). Image-based image retrieval operates in harmony with the mediality of electronic images, for in electronic memory, we don't have to direct image by meta-data exclusively, but we can open them up immediately according to their genuine optical statements. One digitized, images can be visually calculated and internally navigated.

Pixelling the image

Computerization creates a promise (which maybe only an illusion) that images that traditionally resisted the human attempts to describe them with precision - will be finally conquered. After all, we now easily find out that a particular digital image contains so many pixels and so many colors; we can also easily store all kinds of metadata along with the image <Manovich ebd.>

- now that images are being understood themselves as data sets - a cluster of pixels.

¹⁵ See his *Algebraic Geometry* und his *The red book on varieties and schemes* (1999)

Calculating images, MPEG-7 allows for "layered" image composites and discrete 3D computer generated spaces; according to Lev Manovich the shift is from a "low-level" to "high-level" meta-data that describes the structure of a media composition or even its semantics.

But on the contrary, in order to retrieve digital images by image content, we have to insist on the computability of the imagined world. For monitoring systems to process a large amount of electronic images, such as human faces, such systems have to get rid of semantic notions of *Gestalt*.

This is why the IBM QBIC system (Query By Image Content) does not try to radically decide in the quarel between semantic versus non-semantic information, but rather to distribute the task according to the respective strength in the human-machine interface:

Humans are much better than computers at extracting semantic descriptions from pictures. Computers, however, are better than humans at measuring properties and retaining these in long-term memory. One of the guiding principles used by QBIC is to let computers do what they do best - quantifiable measurements - and let humans do what they do best - attaching semantic meaning¹⁶

- which establishes a feedback-loop between man and machine and stages the difference between analogous and digital data processing, thus not trying to efface, but to creatively enhance the human-computer-difference where they meet on the interface.

The topic of "Meta-dating the Image" is a subset of the larger theme of DEAF 003 - "data knitting", which reminds us of the first digital image production by the Jacquard loom in France around 1800, providing the idea for Charles Babbage's first computer design.

See the pixel works of the media artist Angela Bulloch:

In her installation *Blow up TV* she uses a key visual, a sequence from Michelangelo Antonioni's film *Blow Up* (1966): the protagonist, a photographer, hiding behind a tree taking photos to discover a murder; but in trying to identify the spot, the closer the camera looks, the less is the apparent murder an evidence. The artist extends this process of identification by yet another magnification, enlarging the digital scan of this scene in great blocks of its single pixels. Thus the image *implodes* by slowing down the cinematographic motion to one digit per second (thus undermining the copyright which is based on the recognizability of the motive for the spectator), and on the other hand the original image *explodes* within a sequential modular system of purpose-build

¹⁶ Myron Flickner et al., Query by Image and Video Content: The QBIC System, in: Maybury 1997: 7-22 (8)

so-called *pixel boxes*, where one pixel is represented in a 50 x 50 cm monitor which are attached to complex RGB lighting systems which can be generated and programmed with any digital information¹⁷ - a desillusion of the image betrayal of the human eye, reavealing the scanner-gaze of the computer which is media-archaeological, looking at a different kind of archive, not looking for letters any more. The pixel modules point at the fact that digital images are hyper-indexically composed by pure information, as opposed to the referential image like the classical photography which still suggest a pre-discursive real.

Beyond culture?

Visual search engines that can deal with iconological queries are still in their infancy - for example *Cobion* in Kassel, crawling the web for illegal trade-mark copying. „The similarity-based images retrieval technology is either militarily or commercially, not really culturally driven“ (Lev Manovich).

"Contentism" is the iconological heritage and cultural burden which hampers our digital performances.

Similarly, the metadata provided by an image database software I use to organize my digital photos tells me all kinds of technical details such as what aperture my digital camera used to snap this or that image - *but nothing about the image content*. <Manovich>

Digital technologies liberate us from contentism.

While computerization made the image acquisition, storage, manipulation, and transmission much more efficient than before, it did not help us so far to deal efficiently with the automated description and access to the vast quantities of digital image being generated by digital cameras and scanners, by the endless "digital archives" and "digital libraries" projects around the world, by the sensors and the museums ... - unmanagable by human manpower any more.

¹⁷ Such is the installation *BLOW_UP T.V.* of Angela Bulloch in the gallery Schipper & Krome, Berlin, September to November 2000