VIDET: MEDIA ARCHAEOLOGY AS SUBJECT AND OBJECT OF ELECTRONIC IMAGING AESTHETICS

[Extended version of keynote at workshop & symposium *Play/Pause, FF/Rewind. Shard Practices & Archaeology of Media*, (organized by Ege Berensel / Andreas Treske, Bilkent University (Department of Communication & Design), Ankara, October 3-7, 2017]

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This presentation will unfold on three levels: *i*ntroduction of Media Archaeology as method of technological analysis, as aesthetics of perceiving "media" signals, and as "computer-aided" research enacted by analytic media themselves; an application of this approach to what has been "analog video" and the epistemic object "videocity"; finally addressing the necessity of "radical" (in the techno-logical sense) and "rigorous" (in the critical sense) Media Archaeology and classic video in the analysis and synthesis of the "digital image".

I Media Archaeology as method of technological analysis

The video tube *avant la lettre*. Media archaeology as research method

The term "media archaeology" is *en vogue* in media studies; path-breaking have been the writings of Siegfried Zielinski such as *Deep Time of the Media* (even if more recently Zielinski prefers the term "variantology"[1]). Path-breaking have been Bruce Sterling's "Dead Media Handbook Project", and the writings of Erkki Huhtamo, and notably Jussi Parikka more recently.[2] There is a soft version of "historical media archaeology", which is rather about bringing "dead media"

1 For a "variantology" which is at the same time technically precise, see especially Siegfried Zielinski / David Link (eds.), Variantology 2. On Deep Time Relations of Arts, Sciences and Technologies, Cologne (Walther König) 2006

2 See Erkki Huhtamo / Jussi Parikka (eds.), Media Archaeology. Approaches, Applications, and Implications, Berkeley / Los Angeles / London (University of California Press) 2011

knowledge back to consciousness again into contemporary digital media culture; another school of Media Science rather differentiates media archaeology ontologically from such forms of still writing media in historiographical terms.

Media epistemology strikes sparks of knowledge from *from within* technology. The art of such closest reading is media philology. Finally, the term media archaeology describes both a field of study and a method of inquiry. But let us destinguish, first of all, media archaeology, in its rather epistenmologic understanding, from what it is not, to avoid misunderstandings. Only occasionally it is about digging out obsolte media from the past or to remember alternatives to existing technologies.[3] Media Archaeology defends the "antiquarian" approach to machines and automata indeed, as way of very haptic reexperiencing technological materialities from the past, even if antiquarianism in nineteenth und 20th century came to be considered antiquated itself and has been replaced by philosophies of cultural history as background discourse for research into past materialities.[4] Antiquarians once practice(d) what the archaeologist Eduard Gerhard once successfully termed "monumental philolology", which became "forensic analysis" in terms of Matthew Kirschenbaum. Material knowledge of the past grants a certain independence from being all too immediately absorded into the symbolical order of narrative historiography. A notorious case for *technological reasoning* which never looses touch with actual technological devices is Gilbert Simondon's seminal philosophy of technology from 1958, called *On the Existence of Technical Objects* in English, where he carefully analyzes the themionic vacuum tube (and its differentiations from Diode to Triode to Pentode etc.) - the device which gave rise to the meaning of "electronics", itself different from mere energetic electrics (a cetegory sometimes confused in the media theory of McLuhan).[5]

[While Michel Serres in a convincing example demonstrates that there is not simply "new" machines or media but rather a coexistence of elements from different times in the same operating system like a car with all its ingredients ranging from the pre-historic wheel to the combustion motor, Simondon rather directly focuses on the starter which initiates the motor action by a delicate combination of electro-magnetic triggering and its energetic transduction into a motion impulse to start the repetitive rhythm of the motor.]

Electronics is defined by the subte, "intelligent" application of micro voltages to manipulate current based events, where the current is not used for energetic purposes like in a traditional light bulb but to modulate the flow of electrons within a vacuum glass body itself.

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3 See the transcript of an interview by Thomas Hill, Vassar College, Dept. of Art, Poughkeepsie, N. Y., on occasion of W. E., *Digital Memory and the Archive*, in the academic radio program *Library Cafe*, http://library-cafe.org
4 See W. E., Let there be irony. Cultural history and media archaeology in parallel lines, in: *Art History* Bd. 28.5 (November 2005), 582-603
5 Gilbert Simondon, Du Mode d'Existence des Objets Techniques, Paris (Aubier) 1958; reprint 2005

[The thermionic tube can be regarded as a major player in media art, if it is not reduced to its external appearance as "the tube" as monitor interface. It began its career as a radio amplifier, but as a picture tube, it is the only instance of an "internal" electronic element becoming human-machine-interface as the same time. The tube has been (mis-)used much later as a digital switch for the pure processing of information.]

[In the seminal chapter one "The Medium is the Message" of Marshall McLuhan's *Understanding Media* from 1964, the author points out that the light bulb is pure medium, unless it is used for informational purposes, such as light-bulb based optical Morse code in telegraphy. With a flip-flop circuitry consisting of basically two coupled thermionic tubes for binary switching, the basic unit of information, the "bit", the evacuated light bulb re-entered the media theatre, this time not for its electric, but electronic capacities.]

Thomas Alva Edison rather occasionally experienced this techno-epistemological difference the moment when his object of experimentation, the evacuated glass bulb, sublimely produced what later became known as the Edison effect: a shade of colour produced by the electron flow at the anode end of the evacuated glass bulb, like a first video or TV tube *avant la lettre*. Sometimes technological objects have implicit knowledge even before any human even has an idea of its meaning and use. Instinctively, Edison made sure that this phenomenon observed in 1875 and refined in 1883, while trying to improve his new incandescent lamp, got patented. But this is not media phenomenology at all, but electrons in action. In a vacuum, electrons flow from a heated element - like an incandescent lamp filament - to a cooler metal plate - the classic example of thermionic emission.[6] How to write such persistent electronic media events (which eventually resulted in the video and television tube) not simply in terms of history of cultural modernity?

An abbreviation of "Media Archaeology"

The term "archaeography" is indicates alternatives models of writing the being of media in time, thus: an alternative to narrative historiography of media "origins" in the historic sense, rather the indication of another level of media tempor(e)alities: its persistent governing principles, archaic essentials which endure into the present.

Media Archaeology encompasses a variety of approaches to media, all of them are interrelated but as well differentiated. To name the different levels, media archaeology is a method of media analysis; it is adressing the structures of media practice (which Foucault named as *l'archive*, such as Internet protocols[7] or the von-Neumann-architecture of digital computers). Furthermore, Media Archaeology is an aesthetics (the "cold gaze" of distanced understanding); it is an "archivology", that is: deeply obliged to archival evidence and technological precision (circuit diagrams and literal source code as source of evidence). There is a certain nostalgia for the analogue indeed in the media archaeological

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6 https://en.wikipedia.org/wiki/Thermionic_emission, accessed October 2, 2017

7 See Alexander Galloway, Protocol. How Control Exits after Decentralization, Cambridge, Mass. / London (MIT) 2004

impulse - but this should be kept private. In addition, Media Archaeology is an art form (to name Paul DeMarinis' installations) which reduce contemporary media complexit to its basics as opposed to the intangible hiddenness of micro-chips in ubiquitous computing today ("reduced to the max"). It is a form of generating knowledge with technical media themselves as active agents, even archaeologists, like digital signal processing restored early "phonographic" recordings of John Logie Baird's experimental 30-line electro-mechanical television. An echo from the media-artistic side is Gerhard Sengmüller´s *VinylVideo* project. He calls his undertaking a "piece of faked media archaeology"; it shares with technically serious media archaeology the bias to reminds viewers of the basic, even archaic *principles* of TV image functions - reducing electronic complexity to their technological *arché*.

Media Archaeology is a gesture of "open source" indeed, de-constructing hardware: not simply in the sense of public usage of source codes in programming, but in the sense of dis-mantling media from their designed enframing, un-clothing the chassis. As an approach to the materiality of media, Media Archaeology is akin to Classical Archaeology which deals with the material remains of a culture, different from philological hermeneutics.

But caution once more, let us not be seduced by the archaeological metaphor. On occasion of the February 2004 festival "An Archaeology of Imaginary Media" at De Balie in Amsterdam it became apparent that many authors take the term "media archaeology" at face value, almost metaphorically: referring to the "digging out" of forgotten machinic visions of the past, of alternative media in the baroque, f. e., media which were never materialized or which are simply forgotten today. Media archaeology is n o t about beginnings, about origins in the temporal sense, but rather about the *arché*, the laws governing media in action. These principles are rather structural than temporal, though it happens that at its emergence a medium most openly reveals its structures before it becomes dissimulated by interfaces.

The "cold gaze" is a description of the media-archaeological aesthetics indeed, admittedly close to Ernst Jünger's photographic media aesthetics. German pre-war or on-war engineering culture still lurks through, just like Heidegger's way of fundamentally re-thinking the categories of technology. After the proudly acclaimed "acoustic turn"[8] and the emergence of Sound Studies, the "cold gaze" is accompanied by unpassionate "understanding", listening to *sonicity*, that is: sound emerging from within technomathematical media.[9]

Media Archaeology is techno-centristic, that is: machine- and code-centered indeed.[10] While Media Phenomenology concentrates upon the mostly screen-based media effects on humans (for which the opaqueness of its technology seems almost mandatory not to divert physiological attention), Media

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8 Petra Meyer (ed.), acoustic turn, Munich (Fink) 2008

9 "Where are the ears of the machine", Morten Riis asks in an essay published in the online journal xxx

10 As expressed in Wendy Hui Kyong Chun, Introduction. Did Someone Say New Media?, in: New Media, Old Media. A History and Theory Reader, eds. Wendy Hui Kyong Chun / Thomas Keenan, New York / London (Routledge) 2006, 1-10 (4)

Archaeology intends media-awareness by making "transparent" its technology itself, opening the proverbial Black Box. The field of (new) media theory seems split between two very different approaches: "Media archaeologists [...] describe the non-discursive practices of the techno-cultural archive. Media phenomenologists [...] analyze how phenomena in various media appear to the human cognitive apparatus, that is, to the mind and senses."[11] The archaeological / archivological approach is rooted as much in Foucault's definitions[12] as it is connected with Marshall McLuhan's non-contentist media analysis. Whereas Mark Hansen in his media-phenomenological discussion of what is an "image" in the age of new (that is, electronic and digital) media, in an explicit Bergsonean tradition insists on the coming-into-being of the mediated image in the "enframing" acts of the human bodily cognition only[13], "posthuman cultural studies"[14] radical media archaeology takes the point of view of the machine itself, with the quality "radical" to be interpreted in two ways: going to the roots (which is the archive), to the beginnings (less historic causality but temporal originality: the opening and generation of the time-critical *momentum*[15] and of temporal horizons), and in the sense of the mathematical square root as the constitutive force in algorithmic, technological media. So-called software studies[16] and a refreshed materialist (forensic) approach[17] on both sides of the Atlantic join in. Media Archaeology is close to mathematics indeed. Foucault took enunciative logics instead of (like Hegel) cultural history as the foundation of his archaeology of spirit. Thus a notion of *Archeology of Knowledge* comes into play which does not want to be understood metaphorically or philosophically, but strictly mathematically: as the study of enunciative functions.[18]

Soft *versus* analytic media archaeology: theory and method

The ancient Greek component *arché* in the term *archae*ology does not exclusively refer to origins but as well to principles, to structures; media

11 Kjetil Jakobsen, in chapter 6 of his text "Anarchival Society", discusses "Archaeology versus phenomenology", in: Eivind Røssaak (ed.), The Archive in Motion. New Conceptions of the Archive in Contemporary Thought and New Media Practices, Oslo (Novus) 2010, 127-154 (141)

12 The archive "governs the appearance of statements as unique events", whereas archaeology "questions the already-.said at the level of its existence <...> and the general archive system to which it belongs": Michel Foucault, The Archaeology of Knowledge, New York (Tavistock) 1972, 129 and 131

13 Mark B. N. Hansen, New Philosophy of New Media, Cambridge, Mass. (MIT Press) 2004, 13. See Henri Bergson, Matter and Memory, New York (Zone Books) 1988, 35f

14 Geoffrey Winthrop-Young, Cultural Studies and German Media Theory, in: Gary Hall / Clare Birchall (eds), New Cultural Studies, Edinburgh (Edinburgh University Press) 2006, 88-104 (100)

15 See Axel Volmar (ed.), Zeitkritische Medien, Berlin (Kulturverlag Kadmos) 2009

16 See Matthew Fuller (Hg.), Software Studies. A Lexicon, Cambridge, Mass. / London (MIT Press) 2008; Jussi Parikka, Digital Contagions. A Media Archaeology of Computer Viruses, New York et al. (Peter Lang) 2007

17 See M. Kirschenbaum, Mechanisms. New Media and the Forensiv Imagination, Cambridge, MA (The MIT Press) 2008

18 Michel Foucault, Archeology of Knowledge, 1969/1974: 106

archaeology thus aims at revealing the essential principles which drive media in the technological sense (both material hardware and symbolic software). Media Archaeology makes salient those technological elements which (beyond the special knowledge of engineers and mathematicians and computer scientists) are worth of knowledge beyond experts in a philosophical sense, while at the same time, the methods of Radical Media Archaology rather have the ambition to turn Media Studies into Media Science.

The crucial question which differentiates Media Archaeology from Science & Technology Studies is this: Are machines really "social before being technical"[19]? Recent STS place technological development within a broader social, discursive and cultural frame of reference; an exemplary analysis of the layers unfolding from techno-endogenic research, then technological implementation, to final media-economic application is Hugh G. J. Aitken's monography *Syntony and Spark* on "The Origins of Radio" (subtitle)[20].

Radical media archaeology rather looks at the epistemological *momentum* behind the subsequent re- and discoveries, at techno-mathematical constellations rather than for media-sociological roots. Such moments erupt as conceptual discontinuities, physical thresholds, technical limits and data series - as (non-technically) expressed in the introduction to Foucault´s *The Archaeology of Knowledge*.[21] Such discontinuities frequently arise from within technological devices before they become modified into what is commonly known as media itself, by endogenic "revolutions" (in Thomas S. Kuhn's sense of paradigm shifts), therefore answering for *dis-continuing* philosophical shifts of questions and tools on the human analysis side such as "cultural analytics", as practiced by media scholar Lev Manovich for "big data" in contemporary image-based communication.

Media, if not understood in terms of communication studies, but conceived as physical channels of communication and as techno-mathematical artefacts which are operated by symbolic codes and streaming data, ask to be analyzed in ways different from texts or works of art. The archeological gaze (theory in the ancient sense of "insight") is such a way of looking at media objects: enumerative rather than narrative, descriptive rather than discursive, infra-structural rather than sociological, taking numbers into account instead of just letters and images. Images from data bring us back to the American Standard Code for Information Interchange (ASCII), based on a seven bit structure, which in early days of computing was used for transmitting photos and graphics as well by pixeling the visual information and translating it into the available 128 characters. Different art projects refer to this digital Stone Age, such as *ascii Vision* in the context of the works of the *ascii-art-ensemble*.[22]

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19 Gilles Deleuze, Foucault, trans. Seán hand, Minneapolis 1988, 13

20 New York / London / Sydney 1976

21 The Archaeology of Knowledge [FO 1969], New York (Routledge) 1972. For an current media archaeology of cinema, see Thomas Elsaesser, Film History as Media Archaeology. Tracking Digital Cinema, Amsterdam (Amsterdam UP) 2016

22 visomat inc., asciiVision, in: Thomas Y. Levin, Ursula Frohne / Peter Weibel (eds.), CTRL[SPACE]. Rhetorics of Surveillance from Bentham to Big Brother, Cambridge, Mass. (MIT) / Karlsruhe (ZKM) 2002, 372

Positioned between archaeology as academic discipline for analyzing material culture from the past and the Foucauldean notion of *l'archive* as the set of rules governing the range of what can be verbally, audiovisually or numerically expressed at all, media archaeology is a) a methodic way and aesthetics of practicing media studies and media criticism, b) an effort to re-enact apparently "dead" media and their reverse engineering,
and c) an awareness of moments when media themselves, not exclusively humans any more, become active "archeologists" of understanding and insight, such as imaged-based image retrieval within digitized media archives. Beyond Marshall McLuhan, media are not just extensions of men any more, but become chrono-poetic themselves.

Media Archaeology *versus* Cultural Techniques": *Kulturwissenschaft* and / or Media Science?

A critical differentiation between *Kulturwissenschaft* and Media Studies allows for the concept of "cultural techniques" to be located *outside* radical media archaeology. Media archaeology as research method does not describe media phenomena in discourse analysis, but seeks for their grounding - *Erdung* - in material and/or logical artefacts. While film studies and social history generally discuss the emergence of sound film (after the age of silent movies) in terms of social discourse and narrative content, media archaeology focuses on the photo cell as the electronic *a priori* for the emergence of sound film in the late 1920s.[23] The photoelectric event, though, is "cultural technique" no more.

II Media Archaeology applied to "videocity"

Case photography

There is an active archaeological discontinuation of evidence and aesthetics from the human body and mind by technical devices themselves. The media-archaeological approach is "anthropodistant"; the painter and draughtsman William Henry Fox Talbot, know as inventor of negative photography, explicitely celebrated the liberation of painting from the human hand by an apparatus for self-registering nature. When Talbot supplemented the traditional *camera obscura* by a medium for recording and reproducing light-based imagery, he celebrated the liberation from his subjective, "interpretative" painterly hand by the apparatus which does not understand but register light intensities of silver halogenite crystals - different from copper engraving of lithography which still is a kind of interpretative "criticism" of the image to the reproduced (Segolen leMen).

The camera obscura already "cannot be reduced either to a technological or a discursive object: it was a complex social amalgam in which its existence as a textual figure was never separable from its machinic uses. ... the camera obscura must be extricated from the evolutionary logic of a technological

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23 See Paul Hatschek, Die Photozelle im Dienst der Tonfilmwiedergabe, Halle (Wilhelm Knapp) 1948

determinism"[24], which narrates is "as a precursor or an inaugural event in a genealogy leadint to the birth of photography" <ibid.>. But in terms of media archaeology, the "inaugural event" is not only fixed to its historical invention and evolution but techno-structural: ongoing and embedded in later escalations.

Talbot, in 1840, photographically reproduced a manuscript.[25] In hat moment, the record becomes object of a light processing technique - which has nothing interpretational while it happens, resulting in a media-archaeologically distant, apparatus-based recognition of a text as an optical signal event - just like Dziga Vertov ("kinoki") and Ernst Jünger asked for the "optische Distanznahme" and the "kalte Person": lessons to learn from technical signal processing. Discourse (kontext -dependency) is replaced by apparative observation. Talbot in his introduction to *The Pencil of Nature*: The photographic plates „have been formed or depicted by optical and chemical means alone, and without the aid of any one acquainted with the art of drawing“ - a media-archaeolgical radicalisation and discontinuity with artistic *mimesis*, semantics and hermeneutics of images: „The picture, divested of the ideas which accompany it, and considered only in its ultimate nature is but a succession, or variety of stronger lights thrown upon one part of the paper, and of deeper shadows on another."[26] This today is high resultion in digital *scanning*. „The instrument chronicles whatever it sees, and certainly would delineate a chimney-pot or a chimney-sweeper with the same impartiality as it would the Apollo of Belvedere“[27] - and such "chronicles" are different from hand-held *Annales* in medieval times

The surgical camera gaze: "Images" from data

To go further with Foucault, there is an analogy between the media archaeological and the medical observation.[28] With the surgical gaze becoming more and more dependent on *imaging* technologies, both perspectives converge literally.[29]

While human cognition takes the (moving) technical image for granted, that is: as "given", and focuses on *gestalt*, Media Archaeology analyses the time-critical *coming-into-being* of what humans (mis-)concive iconically, sonically, or textually.

So what is "media art"? An artform just using technical devices as augmentation, or a genuinely technological artform in itself? Media archaeological art treats images not iconologically, but with the "cold gaze": as a set of functions, thus calculable (rather than narratable). Just as in Dziga

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24 Crary 1990: 31

25 Karl Krumbacher, Die Photographie im Dienste der Geisteswissenschaften, in: Neue Jahrbücher für das klassische Altertum 17 (1906), 601-660 (607)

26 London 1844; Reprint New York: DaCapo Press 1969, o. S.

27 Ebd., Text zu Tafel II „View of the Boulevards at Paris“

28 See Michel Foucault, Birth of the Clinic, xxx

29 See Markus Buschhaus, Über den Körper im Bilde sein. Eine Medienarchälogie anatomischen Wissens, Bielefeld (Transkript) 2005, 171

Vertov's film *The Man with the Camera*, cinematography is not *for human eyes only*, but Kino-Glaz.

Once digitized, images can be algorithmically calculated and intrinsically navigated. 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 leed to unexpected insights in visual culture. Beyond human semantic tagging, nonhuman metadating of "image" or "audio" files no longer forces a foreign medium (texts) upon the data, but approach them in their own digital logicity. Literally "on the other side", media archaeolgy deals with time-critical psycho-physical perception as well. Thereby media archaological analysis operates in well-differentiated, still (in its distanced "view") parallel lines to the neuro-scientific approach.

Some human perceptual processes "operate upon data on the screen in a direct, bottom-up manner by examining the data in very brief periods of time (utilizing little or no associated memory) and organizing it automatically into such features as edge, color, depth, motion, aural pitch <...>."[30] Such bottom-up perception is media-archeological *aisthesis* indeed.

Media archaeology is akin to the gaze of the optical scanner. Such as the electronic tunnel microsope does not actually transfer images of the atomic surface of matter, but analyses its object by matching data statistically and reprsenting these calculations as images - just like bats don?t perceive space iconically, but by echo orientation in space[31] - culture-free images.

The signifying decipherment of images is not a priviledge of animals alone any more. There are now options for search enginges: visual search with precise targeting, down to each pixel in an image. Such monitoring systems perform a different panoptical regime: they do not concentrate on iconology, but on data patterns and clustering. David Gordon's video art installation *24 hours Psycho* media-archaeologically undermines Hitchcock's film story by slowing it down, just as Angela Bulloch's "Pixel Works", dissolves the cinematographic frame, after digital sampling, into discrete macro-pixels.

An image, for media archaeologists, is different from what an image is to art historians or Visual Studies. The media archaeological gaze is close to radar which is rather a "system of measurement rather than communication"[32]. Radar is an analogue technique rendering a physical image (rather map) of the surrounding area of an antenna, while on the level of signal transfer it operates with discreet impulse- and duplex technology. Thus the radar image is rather "analytical" (in Timothy Barker's sense), a measuring device, than a medium of representation or projection. Both though, TV and radar, are based on the same cathode ray tube; the German TV set which was ready to go into mass

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30 Edward Branigan, Narrative comprehension and film, London / New York (Routledge) 1992, 37

31 See E. Gal, Geschichten vom Finden, in: Schattenlinien Nr. 4/5, 2. Jg., Heft 2 & 3 (1991), 3-35 (6)

32 Woodward (1950), as quoted in: US Signal Corps (1957), here quoted after: Friedrich Wilhelm Hagemeyer, Die Entstehung von Informationskonzepten in der Nachrichtentechnik. Eine Fallstudie zur Theoriebildung in der Technik in industrie- und Kriegsforschung, Diss. Berlin (Freie Universit 舩, FB Philosophie u. Sozialwissenschaften) 19xx, 341

production in 1939 was immediately converted to military uses after the outbreak of World War II.

Focus video art: Notes on videocity

Media-archaeological aesthetics corresponds with the signal *aisthesis* of the machine, as embodied in sensors and transducers. Optical media are suspended from the burden of cultural semantics indeed, in favor of the techno-cultural form; on the contrary, it requires high-performance computing concepts such as "Deep Learning" (Henson) to train machines a sense of cultural iconologies. The media-archaeological answer to this aim is an emphasis on the radical difference between human and machine reasoning (after acknowledging, with Turing 1936, their structual isomorphism). This dramatic difference should not be smoothed or humanized in the media-theatrical scenes interfacing human and machine perception, such as the computer screen, but rather drastically put on display there.

Latin "video" is an anthropocentric term of a technological event: "I see"; the human "eye" and its coupling to the mind "I" might be contrasted by Latin "videt" which means "it sees" in the sense of transducing light into electric signals *vice versa*: the technological gaze of the Cathode Ray Tube itself, and already Vertov's kinematographic "camera eye".

The implicitely sonic, sequential "one-line scanning" of electronic imagery (as defined by video artist Bill Viola and Maurizio Lazzarato's *Video Philosophie*) radically differs from the retinal image projected in the human eye and transduced in a bundle of parallel nerve channels to the electric signal processing brain. Different from katoptic film screen projection, the luminosity of the electronic cathode ray tube; comes from within and invites for media-archaeological inspection, tracing back the electronic "image" event. TV is rather derived from the telephone, in terms of Nipkow's techno-epistemic trick of turning a two-dimensional image into one-line scanning for transmission over a single channel (be it cable, or "wireless" signal transmission).

Video steadily reproduces, regenerates an image as a light-event, instead of projecting a fixed prefabricated image like film does. At this point video image is akin to the neurological process of memorizing and remembering.[33] With its flashing and fading, the temporality ("to death") of the electronic image reveals itself, different from the a-historicity of the matrix of the digital image consisting of pixels; still a lot of technical effort (and electric energy) is needed in order to keep these pixels steady, unlike the photographic film which offers a moving image while running, but is in its individual photochemical components is static and steady image frames. The very term *videocity* is a conceptual analogy to *electricity* – not only on the surface but through an inherent logic; electricity is the prerequisite of the processual video image - rather *flow* than "image".

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33 See Angela Melitopoulos video and text: Timescapes, in: Lab. Jahrbuch 1996/97 für Künste und Apparate, edited by Academy of Media Arts, Cologne (König) 1997, 173-183

Is video an original memory medium?

The instruction manual of the once colossal Video-Cassette-Recorder by Grundig BK 3000 COLOR proudly declares: "With this set you can record and play back colour as well as black-and-white television programmes at anytime. The timer and the integrated receiver enables you to record programmes even when you are not at home or while watching a different channel." Video recording is uncoupling the alliance between memory and space; the *loci memoriae* in the ancient rhetorical *Art of Memory* (Frances Yates) become literally metaphorical, i.e. transferable. Volatile TV-image lines, by magnetic recording, are endowed with an *operative* memory, allowing for syn- and diachronic time axis manipulation; the tape can be erased and re-recorded anytime, as had been known from audio tape recording previously, for the simple (media-archaeological) reason that one-dimensional, therefore linear audio signals are technically easier to handle in signal processing than the two-dimensional image. Analogue electronic imaging actually applied "audio" techniques like the successive scan line.

On the magnetic video tape, new recordings automatically erase the old, while the electronic hardware itself is a con-temporary layer of different technical layers, ranging from the typewriter-like keys of operate the machine ("Play", "Pause", "FF / Rewind") over the dynamo motor driving the reels up to the deleciate electronics of the thermionic tubes or transistors, finally focused on the arche-typal scene of frequency-based technical media: the electro-magnet induction unfolding between the recording tape and the coil within the reading / writing / erasing head(s) of the machine. Old recordings are even erasable without recording any new content: “For this push the record button while disconnecting the aerial cable. Now you are recording only interferences (so-called ‘semolia’).” Therefore erasing is not nothing, but an inverted *signal-to-noise ratio*.

"Erasing" is a practice which has continued from magnetic recording devices up to the notorious Hard Disc drive for computer memory. But the concept of erasing as overwriting is deceiving in terms of what actually occurs with the signals on the material level. For a mathematicized electronic order, a "deleted" data file (for saving memory space) only erases the storage place address, that is the metadata, while the "content" itself remains scattered over the sections of the magnetic disc. Matthew Kirschenbaum has revealed, in detail, the "forensic" possibilities to recoder apparently erased data - the electro-magnetic logic of the palimpsest, most familiar to a textual scholar. Only the brute force of the "Purge" command once actually erased (almost) all data traces from a disc.

Sampling scanner convert the analogue video signal into a digital one to make it processable by computer software, while analogous video is restricted to a merely external attribution of temporal memory adressing. The pre-digital *time code* has been external to signal storage media; the counter served to find particular places on the tape in contrast to the *immediate time code* within the image, by which any element of the image itself becomes discretely addressable. The time of the memory function is that of time made stand still. "Stills" in time-based media however produce disturbances. The very title of

the symposium *Play/Pause, FF/Rewind. Shard Practices & Archaeology of Media* indicates that the phenomenally aparent "flow of time" and the tempoReal of the video signal become technically integrated into the symbolic order of cultural time, by the very discrete keys of accessing the storage tape - like continuous oral speech since alphabetic writing, or type-writing, finally: the turingmachine "tape" operations *alias* digital computing.

Aesthetics of Disturbance: Let there be (video) noise

Only in the moment of technical disturbance the time-based character of the video image is revealed to human perception in its contrast to the static, fixed photographic film still. This eventality is not simply content-based any more but a medium-specific tempor(e)ality. For the case of video, this is obvious in the moment of activating the "Pause" button while playing a video: the video image does not stand still; unlike the film still, it is an image that has to be permanently *refreshed* in order to become visible for the human eye. It is no photography, but a time signal.

Videocity is disclosed in the very moment of break-downs of the image on the monitor screen: Then video becomes "present-at-hand" in Heidegger's sense, making the acoustical and optical humming and disturbance a subject of theoretical and aesthetic reflection. Such micro-traumatic moments are no longer derived from an personally experience, but formed in a techno-constructivistic way. All the difference between analog signal distortion and the digital "artifact" which arises from unintended alteration of data in the process of compression or other algorithmic transformations; only superficially this may be compared to the memory distortions identified for humans by neuroscience and psychanalysis.

Eric Siegel once reminded of the electro-magnetic fields as the true essence of the video "image" by moving a magnet across the electronic TV tube, distorting the image without damaging the set.[34] Disturbance is the essence of electronics, and the simultaneous humming noise of the electronic image is its distinctive feature. In the technical sense disturbances do not occur as irritations on the screen but disclose the nature of transmission itself. Media Archaeology is about such dis/continuities in the very precise engineering sense. According to *http://experimentaltvcenter.org/video-terms*, "noise" is any unwanted signal present in the total signal. But what if noise is part of the media-artistic intention itself, like in Bill Viola's video called *Information* (1973)? The signal-to-noise ratio (S/N), as defined in communication engineering (Claude Shannon), refers to the proportion of desired audio and video information to undesired signals (which still might become aesthetic "information"). And on the most basic media archaeological layer of video art works, the chemical vinegar syndrome refers to the decomposition of an acetate based magnetic tape. It results in a faster loss of the backing, or in so-called "crosstalk" and "print through", the interference of the taped signal by another signal, resulting in distortion of the image or sound. This can occur if signals on the tape imprint themselves onto nearby areas of the tape without

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34 On Shamberg & Raindance Corporation, Guerilla Television, 1971, see Ina Blom, The Autobiography of Video, xxx

artistic intention. It is most noticeable on audio recordings; one may be able to faintly hear a ghost of the other unwanted signal when the tape is played back.[35]

Bill Viola's definition of the electronic image as "sound" of one-line scanning"[36] once unintentionally resulted from such laboratory signal-eventality. His videotape *Information* (1974, color, sound, 30') has been "the manifestation of an aberrrant electronic nonsignal passing through the video switcher in a normal color TV studio, and being retrieved at varous points along its path. It is the result of a technical mistake made while working in the studio ...When the record button was pressed, the machine tried to record itself. The resulting electronic perturbations affected everything else in the studio: ... there was sound where there was no audio connected ... After this error was discovered and traced back, it became possible to sit at the switcher as if it were a musical instrument and learn to 'play' this nonsignal. Once the basic parameters were understood, a second videotape recorder was used to record the result. *Information* is that tape."[37] Implicitely, the title *Information* anticipates the digital image which actually measures aesthetic value in binary information units: neg/entropy.

Digital post-media archaeology?

Media Archaeology, even when applied by non-engineers, tries to get as close as possible to a technological understanding of media artefacts like video; different from specialists, its skill is to identify the technical details which are salient in terms of epistemological surplus. The transformation of the video time signal into the discretely computable frequency domain deserves going deeper into its variances and details; from here, Media Archaeology links to the philosophy of time itself. Instead of storing and processing every single video frame, time itself actually disappears (*idealiter*) with algorithmic sound and image compression.[38]

If the term "image" still makes sense for the photographic frame in cinematography, it has already become problematic with the sequential lines of electronic television and its interlacing of halb-frames. With digital data transmission, even if still conceptual based on the frame of the image, the "image" operationally dissolves. Computing culture asks for new terminology

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35 See Amia Videotape Preservation Fact Sheets, authors: Jim Wheeler and Peter Brothers, editor: Hannah Frost for the Amia Preservation Comittee, 2002; http://www.amianet.org/publication/resources/guidelines/videofacts/about.html

36 Bill Viola, "The Sound of One Line Scanning" in: Dan Lander / Micah Lexier (Hg.), Sound by Artists, Toronto / Banff (Art Metropole & Walter Phillips Gallery), 1990, 39-54

37 Bill Viola, as quoted in: Bill Viola. Installations and Videotapes, ed. Barbara London, New York (The Museum of Modern Art) 1987, 24

38 Strutz 2005: 218: "Die zeitliche Korrelation wird durch prädiktive Techniken vermindert."

which is offered by signal processing theory in physical and theoretical informatics indeed.

The current online media option to watch "streaming video" such as on the Youtube channel heavily relies on efficient digital image compression and their codecs; the MPEG standard is a sequence of frames no more, but after sampling one conventional key frame the algorith calculats only the partial differences arising in the follwing film frames, anticipating the immediate data future by by predictive coding, operated on wavelet analysis and pixel values entropy. Mathematician George Birkhoff once defined the "aesthetic measure" for paintings and other random patterns as a ratio between order and complexity, and those works deemed to be most satisfactory had a proportionately highest degree of symmetry to the number of angles, curves, or irregular forms flowing from one to another.[39] Subsequent cybernetic information aesthetics (Abraham Moles, Max Bense) defined the preditability and degree of redundancy in images, texts, or musical compositions, is actually operated actively by compression algorithms. Video compression techniques reduce the spatial redundancy among the picture elements and the temporal redundancy between successive frames, indeed, by interframe coding.[40] *Predictive coding* and *delta* compression result in a micro-temporal diagram which is no time "window" of the present moment any more (as equivalent to "frame" and optical perspective) but rather a time-critical cascade.

One method of transmitting iconic messages is transmiting, in their place, sequences of symbols.[41] Such micro-temporal operations have become an agency in contemporary media communication in the form of Streaming Video which heavily depends on high compressability of series of images. Digital video compression is in fact a delicate temporal operation based on micro-archival operations; only parts and sections of the image are updated at a temporal moment. MPEG technologies for video compression transform the plenitude of movement into partial sampling. Each frame is divided into smaller blocks of pixels in order to analyze changes from one frame to the next. A group of frames is thereby established around one initial key frame at interpolative intervals. On that basis, probabilistic calculation predicts the location of each block of pixels. Movement takes place through updates of certain sections of the image, while the rest of the frame is replayed as before.[42] Such *delta* compression in video computer graphics is technological chronopoetics, with severe consequences for what used to be "cultural tradition". Lossy image compression in digital conversion of analog video tapes

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39 See Jasia Reichardt, in: Paul Brown, Charlie Gere, Nicholas Lambert, and Catherine Mason (eds.), White Heat Cold Logic: British Computer Art 1960 - 1980, Cambridge, MA (MIT Press) 20xx, 85

40 Tomas Fryza, A Complete Video Coding Chain Based on Multi-Dimensional Discrete Cosine Transform, in: Radioengineering vol. 19, no. 3, September 2010, 421-428 (421)

41 David A. Huffman, A Method for the Construction of Minimum-Redundancy Codes, in: Proceedings of the I.R.E. (September 1952), 1098-1101 (1098)

42 See Trond Lundemo, In the Kingdom of Shadows. Cinematic Movement and Its Digital Ghost, in: Pelle Snickars and Patrick Vonderau (eds.), The YouTube Reader, Stockholm (National Library of Sweden) 2008, 314–329 (316 f.)

to DVD, as a practice in non-archival preservation, makes sense in terms of storage space economy, but leads to non-restorable signals which require interpolation.[43] The preservation philosophy oscillates between restoring the tape *versus* restoring the recording.[44]

Beyond the traditional inventory for textual records, this opens options for movement research based on the moving image from within, suitable in terms of true media-archaeological analysis. Film cuts, for example, are easily traceable because they can be coded as video compression picture types (MPEG). In algorithmicized hermeneutics, is possible to navigate through large amounts of moving images beyond verbal language, in an im-mediate access to images, unfiltered by words. Media philosopher Vilém Flusser once defined *telematics* as the convergence of images and telecommunications, "so new that we experience it as a technical phenomenon and not yet as a cultural one. This is why we speak of things like lasers, cables, satellites, digital transmission, and computer language as if only technicians should speak of such things."[45] From the media-archeaological perspective, such *termini technici* shall resist being absorbed and replaced into more discursive terms. In order to be more precise in describing time-critical processes (in the double sense) resultng from within technologies instead of subjecting them to a totalizing signified called "time", engineering terms actually help to liberate conservative cultural consciousness from the specter of "time".

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43 See Memoriav (ed.), Memoriav Empfehlungen Video, Bern, February 2006. Editing: Felix Rauh

44 See Sherry Miller Hocking / Mona Jiminez, Video Preservation - The Basics (2000)

45 Vilém Flusser, Into the Universe of Technical Images, Minneapolis (University of Minnesota Press) 2011, 80 (initial quote in: Ricardo Cedeño Montaña, Portable Moving Images. A Media History of Storage Formats, "Introduction", 1-19, New York (de Gruyter Arts) 2017