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PARALLEL PERSPECTIVE IN DIGITAL IMAGES

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For some time now, the question of how the relationship between ‘digital images’ – to use a somewhat vague term – and the types of images used in other technical media (photography, film, etc.) should be classed has been a topic of debate. One of this discussion’s central themes, at least at the beginning, was the issue of the images’ points of reference. It was often emphasized that the spread of certain digital images – which were indistinguishable from photographs in visual terms – was leading to the loss of images’ reference to ‘reality’, which had been guaranteed in analog photography. Supposedly this reference was assured by the fact that photographs were linked with the photographed object indexically, that is, causally through light. To give just two examples of this: as early as 1990, Fred Ritchin warned that the advent of the computer heralded the end of photojournalism and its function of acting as a witness to real events and processes.¹ In 1994, Jean Baudrillard claimed that “in the synthetic image [...] the real has already disappeared”.²

This debate takes the reference to photography (and photographic forms of film) for granted. ‘Digital images’ seemed rooted in the tradition of photography and film, simply because they were mainly received in the form of digitalized photographs/films and generated, ‘photo-realistic’ computer graphics. However, in an essay dealing critically with the issue of the possibilities offered by photorealism and the attempts to approximate it through a range of computer graphics techniques, Friedrich Kittler already noted that computer graphics actually rendered all “optics altogether optional”.³ Thus not only the projection of three-dimensional objects onto a two-dimensional surface according to the laws of geometrical optics (vanishing-point perspective), which forms the basis of photographic records and is used in photorealistic computer graphics, is available.⁴ For example, computers are also able – albeit with considerably higher computing effort – to

¹ Cf. Fred Ritchin, “Photojournalism in the Age of Computers.” In *The Critical Image. Essays on Contemporary Photography*, ed. Carol Squiers (London: Lawrence & Wishart, 1991), 28–37.

² Jean Baudrillard, *Art and Artefact*, ed. Nicholas Zurbrugg (London: SAGE, 1997), 30.

³ Friedrich Kittler, “Computergrafik. Eine halbtechnische Einführung.” In *Paradigma Fotografie*, ed. Herta Wolf (Frankfurt am Main: Suhrkamp, 2002), 183.

⁴ On vanishing-point perspective and geometrical optics, cf. B. A. R. Carter, “Perspective.” In *The Oxford Companion to Art*, ed. Harold Osborne (Oxford: Clarendon, 1970), 840–861, esp. 840. To clarify the terminology: in the following, vanishing-point perspective (abbreviated: perspective) is used to refer to the form of projecting a three-dimensional object onto the point of intersection of the straight (hence: ‘linear perspective’) beams of light or lines of sight that form the pyramid of vision. By contrast, the term central perspective refers to a specific form of vanishing-point perspective, one with a single vanishing point.

compute the wave functions that make the simulation of wave-optical techniques and thus the creation of computer-generated holographic images possible.⁵

In his essay – which refers explicitly to physical optics, including geometrical and wave optics⁶ – Kittler fails to mention that computers do not *only* “render all optics optional”, that is, all visual forms of representation related to the behavior of light in all its varied facets. Computers are also able to use all calculable *non-optical representation techniques* – that is, all techniques that ultimately proceed in algorithmic stages of some kind. Here, ‘non-optical’ refers to all representation techniques that are not based on the behavior of light. In principle, computers thus have all calculable visual techniques of representation, whether optical or not, at their disposal.⁷ We can sum this up succinctly as a first hypothesis: the interesting characteristic of digital images (or of computer graphics in general) that sets them apart from earlier technological visual media is not that they are non-referential,⁸ but rather that they have the option to use both optical and non-optical representation techniques.

This first hypothesis leads to a second, according to which the issue of the specific use in question and the combination of different representative techniques – that is, the issue of the formal characteristics of computer graphics in various discursive practices – is more central than the overly general question of what distinguishes computer graphics from previous technological visual media in general. There is a very simple argument in favor of this preference for pragmatics over ontology: computers are machines and can be programmed. They do not specify anything (or only very little). They are able to be and do anything that can be calculated (in an appropriate time period and with appropriate resources) and for which suitable input and output devices are available. Thus Licklider and Taylor referred to the computer as a “moldable medium” as early as 1968.⁹ The actuality of the computer as a simple decontextualized technical object at best tells us what is not feasible yet, but not which of the uses available in principle is chosen. Due to the

⁵ Cf. Sean Johnston, *Holographic Visions. A History of New Science* (Oxford: Oxford University Press, 2006), 216–220.

⁶ Cf. Kittler, “Computergraphik” 183: “Computer graphics, as it they are software, are made up of algorithms and nothing else. Accordingly, the optimum algorithm for automatically synthesizing images can thus be represented both unproblematically and without algorithms. It would simply have to calculate all optical and thus electromagnetic equations known to quantum electrodynamics for measurable spaces for virtual spaces, or put more simply cast the three volumes of Richard Feynman’s *Lectures on Physics* in software.” This physicalistic definition arbitrarily subsumes all computer graphics into one category on the basis of physical optics.

⁷ Even though de facto this calculation may be too costly in terms of time.

⁸ For a critical stance on this hypothesis, cf. also Jens Schröter, “Das Ende der Welt. Analoge und Digitale Bilder – mehr oder weniger Realität?” In *Analog/Digital – Opposition oder Kontinuum? Beiträge zu Theorie und Geschichte einer Unterscheidung*, ed. Jens Schröter and Alexander Böhnke (Bielefeld: transcript, 2004), 335–354.

⁹ J. C. R. Licklider and Robert Taylor, “The Computer as a Communication Device.” *Science and Technology* 76 (1968): 22.

computer's ontological openness,¹⁰ we consider the argument that there are no digital images, as the digital code that forms their basis is aspecific, to be problematic. Conversely: precisely because the digital code is aspecific it is able to code images and the computer can thus be used as a visual medium – as is obviously the case. And once we have admitted to the fact that computers can be visual media, then the preference of pragmatics over ontology also becomes valid on the next level: qua its technical structure (a system of lenses), a camera specifies geometrical optical projection. In the case of the computer-as-visual-medium, optics (and non-optics) are optional; the computer-as-visual-medium 'as such' specifies nothing (or very little). Which of the options is selected can only be deduced from the discursive practices. Instead of distilling ontologies (be it negative ones) from basic technical structures, we need to examine precisely these various uses in discursive practices and the forms of representation and their functions that are thus selected from the range of available options from a historical (or media-ethnological) perspective.¹¹ In methodological terms, thus also means: we cannot assume that technology is an ontological foundation, but rather need to observe discursive practices involving computers (or, if you will, networks of human and non-human actors).

That computer graphics has focused on the paradigm of the photographic is purely down to historical reasons: discursive practices such as flight simulation and, later on, special effects for the film industry gave rise to forms of digital images that remain close to photography (and the photographic film). Depending on the use to which they were put, certain formal characteristics of photography and film also became formal characteristics of 'photorealistic' digital images: vanishing point perspective, grain, blurring of movement, lens flares and so on.¹² By contrast, there is a wealth of examples of non-optical representation techniques (e.g. from painting¹³), and accordingly there is a broad field of computer graphics that has not been subjected to much investigation as yet: *non-photorealistic rendering*.¹⁴

One non-optical representation technique with a long and distinguished history is *parallel projection* (which takes on a range of forms).¹⁵ While it is not based on any form of physical optics, it is nevertheless governed by clear rules and accordingly can be rendered as an algorithm and programmed. It cannot be used by optical media such as photography and

¹⁰ Georg Christoph Tholen, "Überschneidungen. Konturen einer Theorie der Medialität." In *Konfigurationen zwischen Kunst und Medien*, ed. Sigrid Schade and Georg Christoph Tholen (Munich: Fink, 1999), 19.

¹¹ Cf. Margarete Pratschke (ed.), *Digitale Form* (Berlin: Akademie Verlag, 2005).

¹² For more detail on this, cf. Jens Schröter, "Virtuelle Kamera. Zum Fortbestand fotograischer Medien in computer-generierten Bildern." *Fotogeschichte* 23, no. 88 (2003), 3–16.

¹³ Thus the history of painting already reveals that there was no simple, teleological development towards central perspective, but that a range of different perspective-based and non-perspective-based techniques of representation always were and are practiced side by side and mingled; on this, cf. e.g. James Elkins, *Poetics of Perspective* (Ithaca: Cornell University Press, 1994), as well as footnotes 20 and 25 in the present article.

¹⁴ On this, cf. e.g. Bruce Gooch and Amy Gooch, *Non-Photorealistic Rendering* (Natick, MA: A. K. Peters, 2001); Thomas Strothotte and Stefan Schlechtweg, *Non-photorealistic Computer Graphics. Modeling, Rendering, and Animation* (San Francisco: Morgan Kaufmann, 2002).

¹⁵ The term 'projection' still seems to implicitly refer to light, but it can also be understood in the mathematical sense of the word and thus need not imply any reference to geometric optics.

film,¹⁶ but is of key historical importance and crops up in certain discursive practices that use the computer-as-a-visual-medium. It is less concerned with representing what objects look like than with reflecting their basic geometric structure.¹⁷

In the following, (1) a brief introduction to the technique and the history of parallel projection will be given. Subsequently, an outline will be presented of two discursive practices that use computers-as-visual-media, in both of which forms of representation based on parallel perspective – either on its own or as a hybrid form incorporating optical (vanishing-point) representation techniques – play an important role: (2) Computer Aided Design and (3) specific types of computer games. Section (4) draws a few brief conclusions and highlights further possible paths of investigation for future research.

i. Parallel perspective: Overview and current state of research

Figure 1: Orthographic, axonometric, oblique and one-point projection

All kinds of representation based on parallel perspective have in common that the base lines of the objects represented do not converge in a vanishing point, but instead remain parallel. This is the fundamental difference to vanishing point perspective, which is based on the behavior of light. A distinction can be

made between different types (Figure 1): orthographic;

axonometric (which again can be divided into isometric, dimetric, trimetric); and oblique angles.¹⁸

¹⁶ There are borderline cases when extreme telephoto lenses are used, where a geometrically and optically projected image can appear to take on traits of parallel perspective. Cf. Patrick Maynard, *Drawing Distinctions. The Varieties of Graphic Expression* (Ithaca: Cornell University Press, 2005), 28 and 31; David Bordwell, *Narration in the Fiction Film* (London: Methuen, 1985), 107–111. Besides this, in photogrammetry there is also the case of ‘orthophotography’. This usually concerns aerial photographs, for which the geometrical distortion caused by the vanishing point perspective is calculated from the depicted landscape’s topographical structure. Today this is done digitally. This presupposes the availability of a three-dimensional model of the topography in question, which is usually produced using stereoscopic techniques (cf. R. R. Real, “Concept of 3-D Map Display with Stereo-Orthophoto.” *Applied Optics* 11 [1972], 1427–1429).

¹⁷ We should not confuse a representation of objects that uses parallel perspective with a representation of the visible parts of objects that uses vanishing point perspective – that is, a representation based on the rules of geometric optics. In the first case, we are dealing with the objects’ geometry, in the second with an optical representation that complies with a specific model of light based on geometry.

¹⁸ An excellent overview is provided in M. Saleh Uddin, *Axonometric and Oblique Drawing. A 3-D Construction, Rendering and Design Guide* (New York: McGraw-Hill, 1997), 1–19.

These parallel-perspective representation techniques have been known for a very long time, since before the development and systematic representation of central perspective in the 14th and 15th century. They were frequently used alongside and in conjunction with central perspective.

There are several characteristic features of the 'Western iconographic tradition' that differ from central-perspective images: parallel-perspective projections do not refer to 'light' or optics and the 'observing subject'. They depict not so much something that is (potentially) visible – rather, they are ideally suited to practices such as draft sketches that create future objects, as they are able to represent spatial relations more clearly and in a manner that is easier for architects and technicians to comprehend than vanishing point perspective with its foreshortening and changes in angles and lengths.¹⁹ Accordingly – as will be shown in closer detail in the following section – they play a key role in the emergence of modern technological culture, for since the 19th century most technical drawings have used parallel perspective in one form or other.

A closer investigation of the role played by parallel perspective remains a desideratum, as a glance at research on the topic reveals: scholarly discussions of images fail to address the fundamental importance of parallel-perspective images for design processes and consequently for modern technical culture.²⁰ Nor have more specific features of parallel-perspective representation, for example that – unlike with vanishing-point perspective – objects do not get smaller with increasing depth (constant scale), been touched upon to date. This goes particularly for their role in digital media. As parallel perspective – except in the case of extreme telephoto lenses or special post-processing, as with orthophotography – does not necessarily play a role in optical media, it does not appear in general histories of optical media.²¹ The extensive literature on vanishing point perspective only makes cursory mention of techniques that use parallel perspective.²² The only point of connection of

¹⁹ Here, we must be careful not to make Eurocentric generalisations. Parallel-perspective projections had long been the preferred techniques used in Chinese and Japanese painting (including for representations of actual objects) before vanishing-point perspectives were introduced in the 19th century from the West, cf. for example Benjamin March, "Linear Perspective in Chinese Painting," *Eastern Art* 3 (1931), 113–139.

²⁰ Cf. as a prime example Klaus Sachs-Hombach (ed.), *Wege zur Bildwissenschaft* (Cologne: von Halem, 2004); Horst Bredekamp (ed.), *Visuelle Argumentationen* (Munich: Fink, 2006); Hans Belting (ed.), *Bilderfragen. Die Bildwissenschaften im Aufbruch* (Munich: Fink, 2007); Matthias Bruhn, *Das Bild. Theorie – Geschichte – Praxis* (Berlin: Akademie Verlag, 2009); Martina Heßler and Dieter Mersch (eds.), *Logik des Bildlichen. Zur Kritik der ikonischen Vernunft* (Bielefeld: transcript, 2009).

²¹ Cf. Ulrike Hick, *Geschichte der optischen Medien* (Munich: Fink, 1999); Friedrich Kittler, *Optische Medien. Berliner Vorlesung 1999* (Berlin: Merve, 2002); Ralph Köhnen, *Das optische Wissen. Mediologische Studien zu einer Geschichte des Sehens* (Munich: Fink, 2009).

²² E.g. Martin Kemp, *The Science of Art. Optical Themes in Western Art from Brunelleschi to Seurat* (New Haven: Yale University Press, 1990), 233–234; Samuel Y. Edgerton, *Giotto und die Erfindung der dritten Dimension. Malerei und Geometrie am Vorabend der wissenschaftlichen Revolution* (Munich: Fink, 2004), 14; James Elkins, *Poetics of Perspective*, 5 and 257; Hubert Damisch, *Origin of Perspective* (Cambridge, MA: MIT Press, 1994), 30; Klaus Rehkämper, *Bilder, Ähnlichkeit und Perspektive: auf dem Weg zu einer neuen Theorie der bildhaften Repräsentation* (Wiesbaden: Deutscher Universitätsverlag, 2002), 9–11.

possible interest from the point of view of visual and media studies is a short essay by Yves-Alain Bois,²³ in which he discusses parallel-perspective projection under the (problematic) heading of “Axonometry”. However, this essay is too early (1981) to be able to debate the new and important role played by aspects of parallel projection in ‘digital images’ and in computer games in particular on a level (both systematic and historical) appropriate today.

It is not the aim of the present essay to reconstruct, even as an overview, the entire cultural and media history of the various forms of parallel-perspective representation.²⁴ Rather, it aims to cover the more specific example of the role played by such representations in ‘digital images’ and what their significance is in regard to the question of the characteristics of digital imagery.

ii. Architectural and technical drawing and CAD

A range of parallel-perspective representation techniques are vital for design drawings in the fields of architecture and technology. In a 1918 introduction to projection theory, we read:

Every object, be it one that actually exists or one that we can see only in our mind’s eye, can be represented through projection. Such a drawing must fulfil two criteria: 1. it must be a faithful reproduction of the object, or 2. it must provide a correct idea of the object’s shape and size. Thus the drawn representation will be determined by the purpose it is to serve; accordingly, the first criterion applies to all diagrams, and so-called central projection is used in order to produce them; however, the second criterion applies to all technical drawings, and in order to produce them we make use of so-called parallel projection.²⁵

Thus it is possible to depict things that exist using parallel perspective, and conversely it is possible to depict things that do not exist using vanishing-point perspective. Consequently, we are not concerned here with an ‘ontological’ difference between the two techniques, but with one that depends on *practice* – such as the technical *sketch*, for example. Given the fundamental role of parallel-perspective representation in the development of modern technology, Maynard’s²⁶ conclusion that parallel-perspective drawing is a key condition of both industrial and postindustrial modernity is not surprising. Most modern technology – including media technology – would not exist without such technical drawings.

²³ Yves-Alain Bois, “Metamorphosen der Axonometrie/Metamorphosis of Axonometry” *Daidalos* 1 (1981): 40–58.

²⁴ We should also mention the role of parallel projection in modernist art, particularly in constructivism as a criticism of and distancing from the dominant vanishing point perspective, e.g. in Lissitzky, cf. El Lissitzky, “K. und Pangeometrie.” In *Europa Almanach* (Potsdam: Kiepenheuer, 1925), 105–113.

²⁵ Albrecht Schudeisky, *Projektionslehre* (Leipzig, Berlin: Teubner, 1918). On this, also cf. Ingrid Carlborn and Joseph Paciorek, “Planar Geometric Projections and Viewing Transformations.” *ACM Computing Surveys* 10, no. 4 (1978): 465–502; Bernhard Schneider, “Perspektive bezieht sich auf den Betrachter, Axonometrie bezieht sich auf den Gegenstand.” *Daidalos* 1 (1981): 81–95.

²⁶ Vgl. Maynard, *Drawing Distinctions*, 7.

Figure 2: Isometric Drawings from *On Isometrical Perspective*

To give a (very) brief historical overview: in architectural drawing, depictions using parallel perspective have long played an important.²⁷ In his *On the Art of Building*, first

published in 1452, Alberti already notes that the “drawings of the painter” and those of the “architect” are fundamentally different²⁸ – the architect’s perspective is orthographic projection, a special representation technique that uses parallel perspective.²⁹ Orthographic projection is the only representation technique able to render an object completely without distortion or foreshortening.³⁰ Evans writes on the role of orthographic projection in architecture:

In orthographic projection the projectors do not all converge to a point, but remain parallel. Because this is not the way we see things, orthographic drawing seems less easy to place. It does not correspond to any aspect of our perception of the real world. It is a more abstract and more axiomatic system. [...] The advantage of orthographic projection is that it preserves more of the shape and size of what is drawn than perspective does. It is easier to make things from than to see things with. So it is not surprising that orthographic projections are commonly encountered *on the way to* buildings, while perspectives are more commonly encountered *coming from* buildings.³¹

Thus we can represent an object *the way that it looks* (to a subject) or at least would appear (‘a representation true to life’), or the way it is or should be structurally, so as to have a plan for how to produce the object. Images that use parallel perspective are thus prime examples of images that depict not something that already exists, but something that could potentially exist in the future (Heidegger already mentioned that one definition of the image is “a look which is the premonition of a being [yet] to be produced for the first time”³²).

²⁷ Cf. e.g. Wolfgang Lotz, “Das Raumbild in der Architekturzeichnung der Renaissance.” *Mitteilungen des Kunsthistorischen Instituts in Florenz* 7 (1956): 193–226; Wolfgang Lefèvre, “The Emergence of Combined Orthographic Projections.” In *Picturing Machines 1400–1700* (Cambridge, MA: MIT Press, 2004), 209–244.

²⁸ Leon Battista Alberti, *On the Art of Building in Ten Books* (Cambridge, MA: MIT Press, 1991 [1452]), 34.

²⁹ Camerota, *Renaissance Descriptive Geometry*, 196.

³⁰ Cf. Schudeisky, *Projektionslehre*, 3–10; Harold Belofsky, “Engineering Drawing. A Universal Language in Two Dialects.” *Technology and Culture* 32, no. 1 (1991), 25.

³¹ Evans, *Architectural Projection*, 20.

³² Martin Heidegger, *Kant and the Problem of Metaphysics*. 5th ed. Transl. Richard Taft (New York: Wiley, 1997), 65.

In 1822, Farish proposed isometry, an axonometrical technique of representation that offers some of the advantages of orthographic projections and is also able to graphically render objects more easily.³³ Isometry became indispensable to technical drawing, that is, for the development of modern technical culture. It is no coincidence that Farish presented his technique, which remains in use to the present day, within the context of the industrial revolution. In the 19th century a large number of textbooks were written on a range of representation techniques that used parallel projection (Figure 2).³⁴

170 years later: the increasingly important role played by computers in the production of draft sketches since the beginning of the 1990s has shown that parallel-perspective images are also of key significance in the digital design techniques used in *Computer Aided Design* (CAD).³⁵ While a recent volume on the design of cultural technology³⁶ contains a few essays on this field, which otherwise is thematized in only one older essay,³⁷ the development and use of parallel-perspective images in related software developments is not discussed explicitly. It would seem that an analysis of the historical development of this software, the formal logic it implies and the practices associated with it still remain to be examined more closely in research on this field (Figure 3).

Figure 3: Parallel-perspective image drawn in AutoCAD

³³ William Farish, "On Isometrical Perspective." *Transactions of the Cambridge Philosophical Society* 1 (1822): 4–19.

³⁴ E.g. Alois Kurz, *Die isometrische Perspektive* (Augsburg: Lauter, 1840); Otto Möllinger, *Isometrische Projektionslehre (Perspective)* (Solothurn: Gassmann, 1844); Christian Beyel, *Axonometrie und Perspektive in systematischem Zusammenhange* (Stuttgart: Metzler, 1887).

³⁵ On parallel perspective in CAD, cf. Anupam Saxena and Birendra Sahay, *Computer Aided Engineering Design* (New York: Springer, 2005), 54–65.

³⁶ Daniel Gethmann and Susanne Hauser, *Kulturtechnik Entwerfen. Praktiken, Konzepte und Medien in Architektur und Design Science* (Bielefeld: transcript, 2009), cf. particularly the essays by Weckherlin, Pias and Hirschberg.

³⁷ Gernot Feldhusen, "Zur Geschichte von Theorie und Praxis des CAD." In *Architektur automatisch?*, ed. Walter Ehlers (Braunschweig: Vieweg, 1986), 93–103.

Questions arising in consequence include: which design-related practices, aims, and problems, and which traditional techniques of representation have structured the respective software and its representation techniques? However, we are also concerned with issues such as, for example, how the distribution or coexistence of central and parallel perspective emerged within the context of computer usage. For many current CAD programs offer the option of presenting one and the same designed object side by side in parallel and central perspective – thus already pre-empting the hybrid imagery of the computer game.

iii. Computer Games

Images created by computers are able to combine forms using parallel perspective and forms using vanishing-point perspective – which initially suggests a certain similarity to the imagery used in painting. However, in the computer games themselves these images are linked to chronologically developing narratives and ludic, interactive operations.³⁸ Accordingly, computer games represent an excellent example for examining forms of *hybrid imagery* and the inclusion of the viewer/gamer.

It is astonishing how far computer games have come over the course of their still very recent development, from spatially indeterminate games such as *Pong* to the elaborately modelled three-dimensional worlds of current games. However, it is even more astonishing that, despite the triumphal advance of 3D graphics since the early 1990s, nearly all forms of representation are still being used in current games. Thus the history of the development of computer games seems on the one hand to indulge in a kind of “spatial fetishism”,³⁹ while on the other hand virtual spaces are continually being fractured by discontinuity and stylization.⁴⁰ Different representation techniques are combined and penetrate one another within an image and thus connect very different forms of stylization and projection. The decisive factor here is that this ‘peaceful coexistence’ of different techniques of representation can not only be traced back to the different hardware platforms (which all perform differently) – from hand-held systems to high-end PCs – but in many cases is less a technical than an aesthetic decision: “videogames are becoming more creatively iconic.”⁴¹ To exaggerate slightly: computer game images are above all becoming more varied – for technological developments are not aiming only at photographic realism, but rather are constantly expanding the visual repertory available to computer games.

³⁸ On computer game imagery, also cf. Thomas Hensel, “Still Life in the Crosshairs or For an Iconic Turn in Game Studies.” In *Technology and Desire. The Transgressive Art of Moving Images*, ed. Rania Gafaar and Martin Schulz (Bristol: Intellect, 2011).

³⁹ Rolf F. Nohr, “Raumfetischismus. Topographien des Spiels.” In *Computer/Spiel/Räume*, ed. Klaus Bartels and Jan-Noël Thon (Hamburg: Universität Hamburg, 2007), 61–81.

⁴⁰ Cf. Benjamin Beil, “Spiel mit der Perspektive. Von gedrehten, gequetschten und unmöglichen Räumen im Computerspiel.” In *Das Raumbild. Bilder jenseits ihrer Flächen*, ed. Gundolf Winter, Jens Schröter, and Joanna Barck (Munich: Fink, 2009), 239–257.

⁴¹ Steven Poole, *Trigger Happy. The Inner Life of Videogames* (London: Fourth Estate, 2000), 136.

Figure 4: Parallel projection as used in *Crystal Castles* (1983)

In the otherwise extensive literature on spatial representation in computer games, the aesthetic strategies and parameters of these hybrid forms of representation, which depend on both the narrative and the respective game, have only been examined rudimentarily – Schwingeler speaks of an “arbitrary perspective”,⁴² Stockburger of “multiple game cameras”.⁴³ Isometric representation represents a special case among these combinations of perspective, as it forms the only other form of three-dimensional projection besides views that employ vanishing-point perspective. However, literature on the topic of spatial dimensions and perspective in computer games scarcely addresses this special position, dealing with isometric images as a kind of transitional phenomenon between two- and three-dimensional (gaming) spaces.⁴⁴ In doing so, the topic is only briefly touched upon using well-known examples – from *Zaxxon* and *Populus* to *The Sims* – and is not placed within the broader context of the media history of the parallel-perspective image.

This lack of discussion has occurred despite the fact that it was isometric representations that made specific gaming mechanisms that are typical of today’s games possible in the first place, such as simulating gravity (and thus falling off a plane, such as in *Marble Madness*). And three-dimensional levels that the gamer is able to explore freely, which had a lasting influence on the depiction of landscapes and their buildings, only appeared with isometric representations. Thus a game such as *Crystal Castles* first realized *architectural forms* in computer games⁴⁵ – the formal link established between computer games and the tradition of parallel-perspective architectural and technical drawing is obvious (Figure 4).

⁴² Stephan Schwingeler, *Die Raummaschine. Raum und Perspektive im Computerspiel* (Boizenburg: Hülsbusch, 2008), 140–146.

⁴³ Axel Stockburger, *The Rendered Arena. Modalities of Space in Video and Computer Games* (London: PhD thesis, University of the Arts, 2006), 156–157.

⁴⁴ Cf. Schwingeler, *Die Raummaschine*, 119–124; Poole, *Trigger Happy*, 120–123; Leif Rumbke, *Pixel. Raumrepräsentation im klassischen Computerspiel*, www.rumbke.de/data/text/pixel3%20-%20leif%20rumbke%202005.pdf (2005), 239, accessed 29 November 2010.

⁴⁵ Cf. Christian Keichel, “Eine Frage der Perspektive.” *Retro* 12 (2009): 38–44.

The opinion that isometry is only a ‘stopover’ on the way to images organized according to the principles of vanishing-point perspective is usually justified with the argument that this form of representation is only a ‘3D stopgap’ due to the lack of computing power needed to produce ‘real’ three-dimensional gaming worlds. This line of argument is certainly correct in part: many game genres exist (almost) only in vanishing-point and central-perspective 3D versions – in the case of ‘first-person shooters’, this perspective actually defines the very genre. However, isometric imaging has not disappeared by any means; rather, it has and always had its own niche, especially in the genre of strategy games (such as *Sim City 2000*, *Civilization II*), where it remains one of the most commonly used forms of representation to this day. Isometric representation can also be found in other genres, such as action role-playing games (*Diablo* or *Titan Quest*). Nor are these representation techniques restricted to technically less sophisticated independent games, but are also used in current mainstream productions (e.g. *Starcraft II*, *Diablo 3*).

The most important reasons for the continuing popularity of isometric perspective in certain genres have already been mentioned above: the better overview of the game provided by the constant scale and the greater ease with which spatial relations can be calculated. Hence we are dealing with games in which depicting an overview of events in more important than individual perspectives tied to a particular character.⁴⁶ Parallel-perspective representations’ inherent ability to provide an overview brings us to another key topic of Game Studies: the question of the link between gamer and gaming world within these perspectives. For while the (vanishing-point perspective) first-person shooter is repeatedly accorded a prominent position in debates on gaming worlds and immersion,⁴⁷ the so-called ‘God view’⁴⁸ of isometric perspective has hardly entered this key discussion in the field of Game Studies. Once again, we need to refer back to the issue of the changed role of the observer (changed in regard to vanishing-point perspective) implied by parallel-perspective images, linking it to the respective ludic and narrative context. However, even what is probably the most elaborate study on gamer involvement in computer games – Rune Klejver’s *What is the Avatar?*⁴⁹ – basically equates isometric representation with 2D versions.

The hybrid imagery of computer games touched upon above needs to be discussed further against the background of these reflections on the link between gamer and game world. For example, what is happening the third-person shooter *Dead Space* when an isometric map is

⁴⁶ Cf. Henry Lowood and Jon Haddock, “Screenshots. Isometric Memorie.” In *Gamescenes. Art in the Age of Videogames*, ed. Matteo Bittanti and Domenico Quaranta (Milan: Johan & Levi, 2006), 19.

⁴⁷ Cf. e.g. Sue Morris, “First-Person Shooters. A Game Apparatus.” In *Screen-play: Cinema, Videogames, Interfaces*, ed. Geoff King and Tanya Krzywinska (London: Wallflower, 2002), 81–97.

⁴⁸ Cf. Britta Neitzel, “Die Frage nach Gott oder Warum spielen wir eigentlich so gerne Computerspiele.” In *Die Welt der Geschichten. Kunst und Technik des Erzählens*, ed. Alf Mentzer and Ulrich Sonnenschein (Frankfurt am Main: Fischer, 2007), 314–319.

⁴⁹ Rune Klejver, *What is the Avatar? Fiction and Embodiment in Avatar-Based Singleplayer Computer Games* (Bergen: PhD thesis, University of Bergen, 2006).

projected into the game world – a world which is depicted using vanishing-point perspective? Or: What effect do the constant, apparently effortless and natural shifts between a vanishing-point and parallel-perspective representation of the game world in *Action-Adventure Lara Croft and the Guardian of Light* have on gamer and game world? Both these examples show that the dichotomy oft-cited in Game Studies between immersive first-person and third-person representations and (supposedly) distancing isometric perspectives is overly simple. For both games reveal the complex strategies of an “visualization of interfaces”,⁵⁰ specific, partly apparently contradictory connections between gamer and game world, oscillating between a perspective-driven depiction of the game world and an overview representation of which the perspective is not viewer-oriented. In other words: hybrid representations of this kind exemplify the need to pay greater attention and critically analyze the ‘special parallel-perspective traits’ of the images used in computer games (Figure 5).

Figure 5: Hybrid imagery in *Dead Space*

iv. Conclusion and Outlook

The American artist Jon Haddock represents historical events from an isometrical perspective in his pictures, such as Quan Duc’s suicide in protest against the Vietnam War or the assassination of Martin Luther King. Visual material familiar from the media, that is, material that follows the rules of geometrical optics and uses vanishing-point perspective, forms the basis of these works; however, the images are processed using Adobe Photoshop and defamiliarized by changing their perspective into parallel projection (Image 6).

However, Haddock’s images not only have an alienating, defamiliarizing effect, but through their reference to isometric computer games also create a “sense of control”,⁵¹ the possibility of intervening from the god view perspective. In this way, they help us to see the familiar medial representation of these events with fresh eyes. And what is more: the paradoxical interplay of distancing and involvement shows clearly that the parallel-

⁵⁰ Frieder Nake, “Das doppelte Bild.” In *Digitale Form*, ed. Margarete Pratschke (Berlin: Akademie Verlag, 2005), 49.

⁵¹ Lowood, Jon Haddock, 21.

perspective viewpoint on the one hand appears alienating due to the intermedial transformation that has taken place, while on the other hand it also appears ‘strangely familiar’ – for, as has been shown in the present article, it is an established part of today’s (technical) culture. This example once again tellingly reveals the many facets of parallel-perspective (digital) imagery, of which the present article has investigated some key exemplary aspects. It is hoped that this analysis will serve to initiate and inspire further reflections on how this desideratum of visual and media studies might best continue to be investigated.

Figure 6a and b: Jon Haddock, *Screenshots: Quang Due Commits Suicide to Protest Vietnam War* (1963), 2000; *The Lorraine Motel* (1968), 2000

In conclusion, we will attempt to provide an outlook: the specific characteristics of parallel-perspective imagery have consequences, at least if we follow on from those strands of visual studies debate that deal with the implications of vanishing-point perspective as a form: vanishing-point perspective’s orientation of what is visible towards an implied observer was described by Panofsky as an expression or means of creating a “modern anthropocracy”.⁵² But how can this be reconciled with the fact that it is precisely not the images that use vanishing-point perspective, but those that use parallel perspective that play a key role in the development of modern technical culture? For these images do not imply a particular observer and viewpoint and thus do not imply any ‘subject’ (or if so, then a very different, ‘placeless’ one). Does it not rather follow from the suppressed history of parallel-perspective images that the ambivalent empowerment of the subject in images adopting a vanishing-point perspective and the iconic conditions of modern technical culture in fact do not coincide? Should modernity be understood not as an anthropocracy, but as the rule of operational technological processes that are not necessarily anthropologically modelled? And what does it mean when the parallel-perspective ‘subject position’ in the ‘god view’ of some computer games is popularized? Lastly, we might raise the question (with Panofsky) of *parallel perspective as a symbolic form* – however, this goes beyond the scope of the present essay.

⁵² Erwin Panofsky, “Die Perspektive als symbolische Form.” In *Aufsätze zu Grundfragen der Kunstwissenschaft* (Berlin: Spiess, 1992 [1927]), 126.