

## Negotiating the thumbnail image

### The transformative power of search engines and their "good enough" aesthetics

Teilmann-Lock, Stina

*Document Version*

Final published version

*Published in:*

First Monday

*DOI:*

[10.5210/fm.v22i110.7869](https://doi.org/10.5210/fm.v22i110.7869)

*Publication date:*

2017

*Creative Commons License*

CC BY-NC

*Citation for published version (APA):*

Teilmann-Lock, S. (2017). Negotiating the thumbnail image: The transformative power of search engines and their "good enough" aesthetics. *First Monday*, 22(10). <https://doi.org/10.5210/fm.v22i110.7869>

[Link to publication in CBS Research Portal](#)

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**

If you believe that this document breaches copyright please contact us ([research.lib@cbs.dk](mailto:research.lib@cbs.dk)) providing details, and we will remove access to the work immediately and investigate your claim.

Download date: 11. Apr. 2021





# Negotiating the thumbnail image: The transformative power of search engines and their “good enough” aesthetics by Nanna Thylstrup and Stina Teilmann

## Abstract

Thumbnail images are discreet, yet central navigational tools in increasingly complex visual information environments. Indeed, without thumbnail images there would be no image search: they are an inherent part of the information architecture of most digital information platforms. Yet, how might we understand the role of the thumbnail as an attention technology in the digital economy? And what kind of aesthetic does it produce? This paper examines the legal negotiations of the thumbnail image and the ensuing decision to conceptualize the thumbnail as a functional image against the cultural history of visual attention technologies and the aesthetics of their connective function. Such an endeavour, we propose, allows us to understand and appreciate the significant digital economy and particular aesthetic of the thumbnail image despite its apparent subtlety.

## Contents

### [Introduction](#)

### [Negotiating the function and value of the thumbnail image](#)

### [Thumbnail images as attention technologies](#)

### [The “good enough” aesthetic of the thumbnail image](#)

### [Final reflections](#)

## Introduction

thumbnail |ˈTHəm.nāɪ|  
noun

1. the nail of the thumb.
  2. [*usu. as modifier*] a very small or concise description, representation, or summary: a thumbnail sketch.
- Computing a small picture of an image or page layout.

Most of us are acquainted with thumbnails — the miniature images that allow us to display and navigate in information rich environments through visual cues with preview functions. Apart from the ones fastened to our own thumbs, most frequently, the thumbnails we encounter are the ones on our digital interfaces. Thumbnail images typically appear in systems that are gridded or listed to offer better overviews of the information landscapes we roam daily. And they are central navigational tools in increasingly complex information environments, preparing the ground we walk, arranging the views we see and guiding our motions in digital space. Thus, while discreet, thumbnails are an inherent part of the information architecture of most digital information platforms.

While most digital users will associate thumbnails with compressed miniature images, there is no exact technical definition of a thumbnail, let alone any substantial literature on the topic. However, the inconspicuous ontology of the thumbnail image has not gone under the radar of the law. Crucially, in 2002–2003 and 2007, the thumbnail image became the centre of two major United States legal battles: copyright infringement cases with critical implications for the future of the Internet. At this point the online use of thumbnail images in the United States could have been seriously curbed had unauthorized thumbnail reproduction of copyright images been ruled illegal. Yet, two ground-breaking legal decisions determined that thumbnails were non-infringing types of visual representation. Why did the thumbnail image end up with this legal identity and what are the cultural implications of the legal decision? In a previous paper we suggested to approach thumbnail images as infrastructural images whose existence depends on legal and cultural uncertainties (Thylstrup and Teilmann, 2017). We argued in this context that the legal status of the thumbnail image was kept vague to secure a material as well as a symbolic fit

with existing search infrastructures of the Web. And we showed that despite the legal depiction of thumbnail images as neutral infrastructure, multiple uncertainties lurk in the governmentality of the thumbnail practices. Thumbnail interactions always hover between empowering users visually and exercising power over users through its seductive design techniques. Indeed, thumbnail images thrive on the uncertainty of the user, offering itself both as a cure and a symptom of the affective experience of information overload.

In this article we approach the crucial questions emerging from our initial analyses. Building on our understanding of the thumbnail image as an affective infrastructure, we outline and explore the cultural historical trajectory of thumbnail images as visual attention technologies. The thumbnail image has yet to be historicized properly, but this paper draws parallels between the emergence of the photographic contact sheet in the 1930s and the thumbnail image in the 2000s. Moreover, we argue that the interplay between the complex visual and digital economy of the thumbnail image and the legal framework of copyright produce a "good enough" aesthetic of access known also from bootleg videos and visual material mediated by mobile screens. Finally, we link the aesthetic of the thumbnail image to the desirous databases of visual search engines.

In the following section we go over the legal cases to unfold the significance of the thumbnail image in today's information landscapes and lay the foundation of our later explanations of the wider aesthetic and cultural implications of the subtle yet ubiquitous presence of thumbnails in our everyday online environment.

### **Negotiating the function and value of the thumbnail image**

The thumbnail is first and foremost posed as a solution to the problem of information overload: it offers information searchers the possibility of gaining an overview in information rich environments, as well as speeding up their information seeking process through quicker loading times and more efficient navigational tools. Yet, as is often the case with a solution, it fosters new problems. In the case of the thumbnail image, what came in the wake of informational ease was a problem with copyright in images. Thumbnail images are lower resolution copies of images that may, or may not, be in copyright. As a result the question of infringement arises, just like when bad pirate copies infringe the rights of a film producer, despite their reduced quality.

Yet, contrary to many similar cases, two prominent and ground-breaking legal cases established thumbnails of copyright images as non-infringing copies: *Kelly v. Arriba Soft Corporation* 336 F.3d 811 (9th Cir. 2003) and *Perfect 10, Inc. v. Amazon.com, Inc. and A9.com Inc. and Google Inc.* 508 F.3d 1146 (9th Cir. 2007). The confrontational issue in both cases was whether a thumbnail image represents what by law is defined as a 'transformative use' and, accordingly, 'fair use' of the original image. Fair use constitutes an exception to the exclusive right of the copyright holder; if the use of a copyright work is a 'fair use' no permission is required. More was at stake in these cases than mere redistribution of compensation. The finding of a distinctive transformativeness in the use of thumbnail images would be decisive not only for the outcomes of those specific cases, but also for the future of the Internet.

In the first thumbnail case the visual search engine Arriba Soft Image Searcher was sued by the photographer Leslie A. Kelly. The Arriba Soft Image Searcher was an early indexer of images on the Web. It presented search results in the shape of images of reduced size and resolution — thumbnails — providing also links that would allow the searcher to open the original full-size image in a new browser window [1]. Users and the tech industry lauded the visualization of searches as being a progressive development. However, Kelly claimed that the thumbnails were infringing the copyright of his photographs: as the copyright holder he had the exclusive right to reproduce, display and distribute copies of his works. The thumbnails reproduced the photographs in their entirety without the photographer's permission. Notwithstanding, the District Court as well as the Ninth Circuit Court of Appeals found that Arriba's reproduction of Kelly's photographs as thumbnail images for the sake of indexing the Internet was a transformative use to be counted as 'fair use' under the United States Copyright Act. What was the explanation for this, at the time, remarkable decision?

For a court to determine if a use of a copyright work is fair use four factors must be considered: (1) the purpose and character of the use, including whether such use is of a commercial nature or is for non-profit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work. In Kelly it was held by the lower court — and affirmed by the higher court — that the purpose and character of Arriba's thumbnails was 'significantly transformative' and, furthermore, that the thumbnails had no harmful effect upon the market and upon the value of Kelly's works. In their consideration of the four factors the courts emphasized that

Although Arriba made exact replications of Kelly's images, the thumbnails were much smaller, lower-resolution images that served an entirely different function than Kelly's original images. Kelly's images are artistic works intended to inform and to engage the viewer in an aesthetic experience. His images are used to portray scenes from the American West in an aesthetic manner. Arriba's use of Kelly's images in the thumbnails is unrelated to any aesthetic purpose. Arriba's search engine functions as a tool to help index and improve access to images on the internet and their related Web sites. In fact, users are unlikely to enlarge the thumbnails and use them for artistic purposes because the thumbnails are of much lower-resolution than the originals; any

enlargement results in a significant loss of clarity of the image, making them inappropriate as display material. [2]

As noted by the court, the more transformative a new work is in terms of purpose and character the less important the other 'fair use' factors will be: inasmuch as Arriba's use of Kelly's work was 'significantly transformative' this (factor one) came to weigh heavily in favour of fair use. As further noted by the court, none of the other fair use factors outweighed the first factor. The second factor weighed only slightly in favour of Kelly as his images had been available online before Arriba replicated them. The third factor was found to weigh neither for nor against any of the parties: the court held it necessary and therefore reasonable for Arriba to copy Kelly's images in their entirety since it would impede the functionality of the visual search engine if images could not be easily identified. As to the fourth factor the court did not consider thumbnails to harm the market for the original images on Kelly's website: if enlarged thumbnails lose their clarity and accordingly are not substitutes of the originals. (Google Brain, in 2017, has made it possible to turn low-resolution images into high-resolution images by a technology that — so to speak — fills in the gaps of pixelated images. The legal implications of this remain unclear. [3])

*Kelly v. Arriba Soft Corporation* attracted a great deal of attention in tech environments. Amicus briefs were filed by the Electronic Frontier Foundation, Google, Yahoo and others expressing concern for the free and open Internet [4]. At the base of their arguments was that ruling thumbnails as infringing images would effectively destroy the very visual search infrastructure of Web. Yet, the (il)licit nature of the thumbnail situation was not fully resolved and by 2007 the thumbnail issue came up again in a court case that involved Google's image browser.

In *Perfect 10, Inc. v. Amazon.com and Google Inc* Google and Amazon was brought to court by an adult entertainment magazine, Perfect 10 Inc, for infringing copyright in images that the latter leased from a subscription-only Web site. The alleged infringement took place through the medium of Google's search engine 'Google Image Search' (which was introduced in 2003). Google Images provides search results in the shape of images that are associated with a user's search terms. As is familiar to Web users, the search results of Google Images are presented as a Web page with rows of thumbnails that are stored on Google's servers. By clicking on the thumbnails the user will be provided with a window with the original images and a link to the site where to find them [5].

The first court ruled against Google finding that the thumbnails were infringing the copyright in Perfect10's images. However, the Ninth Circuit Court of Appeals overturned the district court on this issue, producing a series of significant reflexions on the transformativeness of using thumbnails. The Court of Appeals declared that

Google's use of thumbnails is highly transformative. In *Kelly*, we concluded that Arriba's use of thumbnails was transformative because "Arriba's use of the images serve[d] a different function than Kelly's use — improving access to information on the [I]nternet versus artistic expression." *Kelly*, 336 F.3d at 819. Although an image may have been created originally to serve an entertainment, aesthetic, or informative function, a search engine transforms the image into a pointer directing a user to a source of information. [...] a search engine provides social benefit by incorporating an original work into a new work, namely, an electronic reference tool. Indeed, a search engine may be more transformative than a parody because a search engine provides an entirely new use for the original work, while a parody typically has the same entertainment purpose as the original work. [6]

The court considered Google's use of thumbnails to be a transformative use of the copyright images; they served a 'further purpose' as compared to the originals. Notably, the court's view was that because the images were not meant for contemplation in themselves they were not infringing copies. Rather, they were algorithmic components that also had a programming significance directing us from one place to another.

When a user clicks on a thumbnail image, the user's browser program interprets HTML instructions on Google's webpage. These HTML instructions direct the user's browser to cause a rectangular area (a "window") to appear on the user's computer screen. The window has two separate areas of information. The browser fills the top section of the screen with information from the Google webpage, including the thumbnail image and text. The HTML instructions also give the user's browser the address of the website publisher's computer that stores the full-size version of the thumbnail. By following the HTML instructions to access the third-party webpage, the user's browser connects to the website publisher's computer, downloads the full-size image, and makes the image appear at the bottom of the window on the user's screen. Google does not store the images that fill this lower part of the window and does not communicate the images to the user; Google simply provides HTML instructions directing a user's browser to access a third-party website. [7]

In this description, the thumbnail is exposed as an infrastructural image (Thylstrup and Teilmann, 2017) consisting of a set of algorithms executed to produce a visual result. Importantly, according to the decision, this visual result should not be perceived as a representation. Rather, it should be understood as a set of infrastructural instructions directing the user's browser, and thus the user, to the original image. The thumbnail image was a passage, not an endpoint.

How might we understand the court's reasoning in a media theoretical perspective? Flusser [8] once mused on the effect of what he called the technical images of our lives, suggesting that

we currently live among commandingly outstretched index fingers, and we will blindly follow their instructions unless we realize that our blind following is exactly what they mean ... they don't signify anything; they indicate a direction.

Flusser's diagnosis was directed at the photograph. Yet, his description of the technical image could also easily be extended to the thumbnail image as it was formulated by the tech industry and cemented with the court's decision: the thumbnail image has no meaningful property of its own; it only indicates a direction.

In the following section we unsettle this functional logic, however, by probing the aesthetic dimensions of the stripped-bare thumbnail and contextualizing these within broader normed cultural sensibilities about image quality and representation and strategic infrastructural considerations. Thus we shall pursue an understanding of the thumbnail as a piece of software that hovers between logistics and aesthetic.

## Thumbnail images as attention technologies

Despite their central place in today's visual culture the thumbnail image has remained locked up in a conception as merely a reduced-size, lower resolution image of an original that no one care to talk about. Perhaps the inconspicuous existence of the thumbnail has made it a neglected object of study. Indeed, despite its ubiquity the thumbnail has not even gained its own independent article in the *Oxford English Dictionary* which amazingly still only contains a draft addition in a computational context dating back to 2006, "A miniaturized version of a document or part of a document; (Computing) a small version of a digital image, freq. acting as a hyperlink to a larger version." *The Dictionary of Computing* is not much more helpful defining a thumbnail as a "A small (lower resolution) reproduction of an image or page, used as a link to the image or page in a web site or electronic document." (*Oxford English Dictionary Online*, 2017)

We might hypothesize, then, that the striking absence of critical theorization of thumbnail images are due to the fact that they are as invisible to a user in today's information landscapes as water seems to be to fish. Yet, as Weiser (1991) reminds us, absence of attention does not equal lack of relevance; rather, "[t]he most profound technologies are those that disappear" weaving themselves into the fabric of everyday life "until they are indistinguishable from it". From this perspective the invisibility of the thumbnail precisely sends a signal of its significance. Indeed, thumbnail images now appear to us as highly ambiguous pieces of software that offer the user not only a directional gesture, but also create a visual environment through which the user moves as well as a beckoning call to explore more.

At first glance, however, thumbnails mainly perform two logistical roles: first, they provide users with a convenient way to quickly browse through large numbers of images simultaneously without being distracted by details. Second, thumbnails provide a convenient way to preview images, not least on small screen devices. Thumbnail images thus offer the user navigational support in an increasingly complex information environment.

Yet as we have argued elsewhere, it becomes clear upon closer examination that thumbnail images exceed their role as operational tools, extending also into the realm of affect (Thylstrup and Teilmann, 2017). Thumbnails are thus often deployed not only to ease wayfinding, but also to sustain exploratory behaviour through visual effects that mitigate the user's sense of overwhelmed by information as well as titillating her curiosity to seek out more knowledge [9]. Indeed, from the outset the thumbnail image was dual-natured: it offered the user a sense of overview (and thus mastery) while at the same time seducing the user to visit new places through its preview function. Underlying both is not only the promise of aiding the user, but also the more fundamental premise of the information economy's demand for increasing velocity and volume of information, as well as a new attention economy where every click and eyeball counts [10]. Within this economy, thumbnails emerge as affective-logistical media objects, technologies of attention [11] as it were, that both seek to capture the user's attention and guide her onwards [12].

While the notion of the attention economy is almost entirely entwined with the emergence of Silicon Valley, the thumbnail image is in fact merely the latest instantiation of a long trajectory of technologies responding to new needs and modes of information navigation. As Saxby (2005) notes, the thumbnail shares fundamental infrastructural traits with the photographic "contact sheet", those long strips of miniaturized images from a photographer's film roll that became a convention of modern photography, closely associated with use of the 35mm camera. Much like the thumbnail image, the emergence of the contact sheet was prompted not only by what was technically possible, but also by what was socially demanded: namely increased rationalization and speed. Contact sheets were a method that allowed the user to quickly edit a large number of pictures and evolved simultaneously with the commercialization and editorial use of photography in the 1930s as it allowed editors to manage the growing amount of information enabled by new technologies and the need to retrieve this information at a faster pace [13].

Just as the contact sheet emerged as a response to a new and accelerated mode of cultural production in the 1930s, so too does the thumbnail image signal another turn of speed in cultural production with new social demands of increased efficiency and traffic. Thumbnails allow the user both to gain an overview over images *and* to act on them at a high speed [14]. Moreover, thumbnail images facilitate the explorative urge of the user through their infrastructural functions by playing "a similar role for an image as an abstract does for an article." (Feng, *et al.*, 2012) [15] The thumbnail is thus not only a compression of information, but also a temporal progression: the thumbnail is an infrastructural component that precedes, or at least invites to, further engagement. Hence, thumbnails in today's commercial and

visually saturated environment should thus not only be efficient, but also attractive. Especially when it works as a form of “commercial” for the content from which it is derived. As a group of Yahoo researchers note, “A great thumbnail ultimately makes a video more attractive to watch, which, in turn, leads to the increase in ad revenue” [16]. In addition to attracting the user, the thumbnail serves to consolidate the initial attraction into a steady flow of engagement.

Within this regime of speed, thumbnails play a crucial role for both user and industry. The user can look for information much more efficiently for two reasons: on a material level, thumbnails reduce loading time; on a cognitive level, thumbnails offer more efficient search practices because the human visual system processes images faster than text [17]. As the user speeds up her search practice, the search industry simultaneously benefits from an increased amount of clicking and browsing, since the quantity of user activity is an indicator of success.

However, the increased speed of information seeking puts pressure on the industry too. Search engines are forced to update and intensify their services to meet the user’s — constantly redoubling — attentional needs and demands as well as the insatiable demands of the advertising industry for more information about user behavior. Google alone received almost 60.000 queries per second in 2016 and more than two trillion searchers that year (Sullivan, 2016). For Google, this number has to constantly increase, since more queries equal more traffic and, accordingly, more user information that the company can then use to showcase how many percentages of the Internet statistical landscape they take up and how much domination of attention they master.

In this economy of attention any event of latency and retardation is potentially fatal for business. Slowness signals infrastructural breakdown and inefficiency often leads to instant user flight to other services that vie for the user’s attention. To prevent the risk of latency, the tech industry therefore constantly seeks to produce new technologies of attention that can capture users and accelerate their pace. Thumbnails play a central role in this quest, providing the user with a sense of overview, an intuitive sense of control and an experience of desire, connecting directly to the ideologies of the digital [18].

---

### The “good enough” aesthetic of the thumbnail image

As can be read between the lines of the legal cases, thumbnail images are more than simple infrastructural objects; they are also complex algorithmic and relational images that play a significant role in today’s attention economy. Their subtle demeanour makes them ideal manipulators, unobtrusive, yet satisfying tools of navigation in a wilderness of information consumption. Indeed, thumbnails are designed to, unperceptively, make demands on our attention, time and desire. Despite their helpful and pleasurable presence they live their life in the shadow of content and are rarely afforded much attention in themselves. Yet, as Peters [19] notes, “[t]echnologies are never only functional: any device always has an element of social display or ‘bling.’” This, we argue, also applies to the thumbnail. While the legal negotiations strive to reduce its existence to the bare minimum as a logistical technology to preserve the infrastructure of the Web, any technical description of a thumbnail would reveal that it has qualities that go way beyond acting as a mere signpost. Thumbnails serve instil a sense of mastery in viewers, seducing them and making them stick around for more (Thylstrup and Teilmann, 2017).

Yet, as shown, the legal decisions effectively secured the thumbnail’s legality confirming that a search engine’s use of the thumbnail amounted to transformative use. Our claim is that courts in this way turned a blind eye to the many other dimensions of the thumbnail image. This infrastructural reduction, which downplayed the inherent value of the thumbnail image, was necessary: recognizing the thumbnail’s worth would hinder image search as it works today. However, in the final section of this paper we would like to pay tribute to the thumbnail’s own allure and distinct aesthetic quality.

The court’s argumentation partly hinged on the thumbnail’s low-grade quality, a technical condition that was argued to degrade the image to such an extent that it was deprived of aesthetic quality. This comparison thus pitted the thumbnail against its high-resolution root image. This standard of comparison produced an epistemology in which the thumbnail automatically appeared as a “poor image” in the face of an adjacent technical sublime, or, at least, an original.

This section suggests that while the court found the lo-fi appearance to attest exactly to its devaluation, the emergence of cultural expressions such as pixel art and retro games native to the digital environment indicate that the very pixilation also carries its own inherent aesthetic [20]. Moreover, we suggest, the low-grade quality of the thumbnail image attests not only to a function, but also expresses a more deep-seated desire for access that we might, with Hildebrand (2009), call an “aesthetics of access.” Hilderbrand’s notion is developed primarily to describe the cultural politics of the low-grade aesthetics of home video. Bootlegging videotape, he argues, isn’t just about duplicating video; it is equally a process of adding an aesthetic value to it. Hilderbrand demonstrates how, with each bootleg, the audience is confronted not only with the content they desire to watch, but also with the process of material degeneration of the videotape made visible by lines and glitches, blurred image and distorted sounds. The high quality of the original is thus sacrificed in the bootleg for the sake of access. Through case studies, Hilderbrand shows how this new aesthetic expression emerged in a period in which the notion of “fair use” became a central concern for artists, policy-makers, corporate executives and digital media scholars, illuminating how much of what we think of as “fair use” derives from debates over the rise of analog video tape in the 1980s and 1990s. Just as analog video developed its own material specific aesthetics of audience access, so too can we read the particular aesthetics of the thumbnail as an aesthetic of user access. Indeed, as Hilderbrand notes, while digital files do not degenerate with use, they do show signs of their accessibility. The aesthetics of access in the digital realm is the aesthetics of compression seen for


instance in user generated videos, ripped mp3s, jpegs, porn and pyramid scheme popups and — of course — the thumbnail.

The low-grade aesthetics of the thumbnail image should not only be viewed through the lens of access, however, but also, we suggest, as an aesthetic expression of the desire to connect. Bassett (2014) argues that mobile aesthetics (an image viewed on a mobile phone) suffer due to technical constraints, but are nevertheless considered good enough for the purpose of creating and viewing by producers and consumers. This “good enough” aesthetics, suggests Bassett, is the direct expression of users’ drive for “pure connection,” and while the “good enough” images may be in lower quality, they have nevertheless in many ways come to dominate today’s visual realm over luxurious high-resolution images.

What both Hilderbrand and Bassett reminds us is that low-grade images — or “good enough” images — such as thumbnail images, contrary to what the legal decision seemed to indicate, actually have an aesthetic value of their own that is directly tied to the affective structures of the attention economy.

---

## Final reflections

Recognizing the particular aesthetic qualities of the thumbnail image, and the role it plays in the attention economy, allows us to understand why the thumbnail image became the centre of legal attention despite its subtle appearance. The court and proponents of the visual search engine infrastructure needed to strategically conceptualize the thumbnail image as an infrastructural component that allows the user to get from one place to the next. Yet, as we have shown, the thumbnail image is not only a functional piece of software, but also a central piece of attention technology symptomatic of today’s digital economy *and* an important visual infrastructure with its own inherent aesthetic. On a final note, we will briefly note that in light of this it therefore makes perfect sense that one of the first to contest the legal identity of the thumbnail as pure functional infrastructure was a company producing adult content: they understood the true aesthetic value of the “good enough” image. Indeed, as Rubinstein and Sluis argue, the thumbnail’s infrastructural connection between the pleasure of viewing and the superabundance of choice provides the thumbnail, and consequently the visual environment in which we all move, with an almost pornographic dimension [21].  End of article

## About the authors

**Nanna Thylstrup** is a postdoc in the Department of Arts and Cultural Studies at the University of Copenhagen. She is the author of the forthcoming book *The politics of mass digitization* (MIT Press). E-mail: nannab [at] hum [dot] ku [dot] dk

**Stina Teilmann** is an associate professor at the Department for Design and Culture at the University of Southern Denmark. She is the author of the book *The object of copyright: A conceptual history of originals and copies in literature, art and design* (London: Routledge, 2016). E-mail: stel [at] sdu [dot] dk

## Notes

1. This process is known as ‘in-line linking’: a technique where a link on a Web page serves to automatically load content (typically an image) from a third-party Web site onto the page. These images are ‘normal’ images and not thumbnails images; their legality was a separate issue in this specific case as well as in the case involving Perfect10, Amazon and Google that followed later.

2. *Kelly v. Arriba Soft Corporation* 336 F.3d 811 (9th Cir. 2003) at 818.

3. See Ryan Dahl, Mohammad Norouzi and Jonathon Shlens, 2017. “Pixel recursive super resolution,” *arXiv* (22 March), at <https://arxiv.org/abs/1702.00783>.

4. See [https://www.eff.org/files/filenode/Kelly\\_v\\_Arriba\\_Soft/20020227\\_eff\\_amicus\\_brief.txt](https://www.eff.org/files/filenode/Kelly_v_Arriba_Soft/20020227_eff_amicus_brief.txt) (22 February 2002).

5. More specifically, when a user clicks on the thumbnail of an image the user’s browser is made to open a new window on the screen which contains the image along with information about it including a link to the site where the image was originally published. As described above this is known as in-line linking and it implies that search result images are framed by annotations from Google’s Web page while the image itself is not stored on Google’s server.

6. *Perfect 10, Inc. v. Amazon.com, Inc. and A9.com Inc. and Google Inc.*, 508 F.3d 1146 (9th Cir. 2007), at 1164.

7. *Perfect 10, Inc. v. Amazon.com, Inc. and A9.com Inc. and Google Inc.*, 508 F.3d 1146 (9th Cir. 2007), at 1155f.

8. Flusser, 2011, p. 50.

9. As Ayers and Stasko (1995, p. 2) note, “Users of hypertext systems often find themselves eagerly following hypertext links deeper and deeper into a hypertext web, only to find themselves ‘lost’ in the sense that they are unable find their way back to previously visited pages. This difficulty in revisiting previously viewed pages may discourage users from engaging in such exploratory behavior. It is hoped

that the addition of the graphic history view will encourage exploratory behavior and help users navigate the WWW more easily in general."

10. As the former Google employee Tristan Harris, notes (Bosker, 2016) the attention economy "showers profits on companies that seize our focus".

11. We derive this term from Crary (1999).

12. Indeed, the capturing processes work in a dual direction. As users spend time on the internet, browsing through thumbnail galleries, clicking on links and downloading images, users engage in a two-way relation in which the visual search engines, and the images they present, capture the users attention just as user in turn capture their content. But the user's very capturing actions allows the search engines to track their IP addresses, track their movement and target them for ads.

13. Yet, while the contact sheet and the digital thumbnail shares logistical traits in the capacity of providing the user an overview of a large amount of information, they also differ in their mediatic affordances. The contact sheet was an infrastructural architecture not only in space, but also in time. In addition to providing a sense of overview, contact sheets also gave indexical insight into an event's progression and a photographer's style (Lubben, 2011). While image-processing software such as Adobe Photoshop and in image search functions more generally echo their polaroid predecessors, they shed these temporal traces in favour only of a panoramic overview.

14. Woodruff, *et al.*, 2001, p. 1. As Woodruff, *et al.* state, "The user must page through lists of Web documents, briefly evaluating each for possible relevance to a particular information need. Improving the efficiency of this tedious process directly benefits the end-user and, by improving end-user satisfaction, indirectly benefits the search engine vendor."

15. This corresponds to one historical sense of the thumbnails as a brief word-picture of something larger, as a "very small or concise description, representation, or summary". The thumbnail image thus facilitate what Shneiderman (2002, p. 2) has pointed out as an important feature in information and communication technologies, namely to give users the possibility to "relax, enjoy, and explore."

16. Song, *et al.*, 2016, p. 659.

17. Woodruff, *et al.*, 2001, p. 2.

18. See also Thylstrup and Teilmann, 2017; as explored by Chun (2014).

19. Peters, 2015, p. 36.

20. A characteristic of the thumbnail is that it is made in lower resolution than high-resolution images. This implies a pixelated look. The thumbnail's pixelated look and style is at first look not unique in the world of the Internet. The fuzzy expressions are found all over the Internet and usually caused by technical and legal limitations and errors in software have given rise to a wide variety of aesthetic genres such as glitch art and pixel art. The most fashionable of these genres is glitch art, which covers works that explore the occasionally expressive beauty of malfunctioning tech. Glitch art has developed into its mode of expression in the art world as a strand of art that explores the materiality of the digital and devotes itself to appreciating failure as a mode of resistance and beauty. To glitch artists and aficionados failure holds subversive potential that can be critically used against the established orders by showing that alternatives are embedded in the dominant culture — with the purpose of showing, ultimately, that power is never total, consistent or omnipotent. Glitch art thus recasts the potential for errors into as a world of possibilities, as a potential escape from calculation and predictability (Menkman, 2011). Another predominant trend in the digital realm that is devoted to the pixelated look is pixel art. To the untrained eye, pixel and glitch art can appear similar in their explorations of the materiality of the digital. Yet, in contrast to glitch art, pixel art is less interested in the subversive potential of the error, and more concerned with the affective potential of the pixel in the form of nostalgia. The question of pixel art has become especially prevalent in the field of computer games, where a pixelated look is employed to produce a sense of nostalgia in the viewer, bringing back childhood memories of more innocent times when times and games were simple. Indeed, games for instance from Nintendo Entertainment Systems, have become vintage collectibles, not only circulating as commodities but also as cultural heritage in historical texts and museum exhibitions at the Smithsonian American Art Museum and the Museum of Modern Art. Yet, if the commercial romanticism of the retro game immediately appears as opposite the avant-garde-approach of glitch art, certain pixel artists carve out subversive realms within the commercialized world of games, promoting independent platforms, subversive feminists approaches and nostalgic dissidence (*e.g.*, Weil, 2014).

21. Rubinstein and Sluis, 2013, p. 30: "Pornography thrives on the notion of plenitude precisely because plenitude itself is sensual, erotic and lustful. Proliferation and abundance create a pornographic effect whether in the context of the App Store, Facebook timeline or Twitter stream. For that reason it becomes misleading to talk about the photographic 'frame' or the singular image as the image is everywhere all at once, accessible from any point in the network, establishing a regime of intoxication and plenitude through its rapid multiplication and profusion."

## References

Eric Z. Ayers and John T. Stasko, 1995. "Using graphic history in browsing the World Wide Web," paper presented at the Fourth International World Wide Web Conference (Boston), at <https://www.w3.org/Conferences/WWW4/Papers2/270/>, accessed 14 September 2017.



Caroline Bassett, 2014. "Is this not a screen? Notes on mobile phone and cinema," In: Marsha Kinder and Tara McPherson (editors) *Transmedia frictions: The digital, the arts, and the humanities*. Berkeley: University of California Press, pp. 147–159.

Bianca Bosker, 2016. "The binge breaker," *Atlantic*, at <https://www.theatlantic.com/magazine/archive/2016/11/the-binge-breaker/501122/>, accessed 16 August 2017.

Wendy Hui Kyong Chun, 2014. *Programmed visions: Software and memory*. Cambridge, Mass.: MIT Press.

Jonathan Crary, 1999. *Suspensions of perception: Attention, spectacle, and modern culture*. Cambridge, Mass.: MIT Press.

Ryan Dahl, Mohammad Norouzi and Jonathon Shlens, 2017. "Pixel recursive super resolution," *arXiv* (22 March), at <https://arxiv.org/pdf/1702.00783.pdf>, accessed 29 August 2017.

Wei Feng, Liang Wan, Zhouchen Lin, Tien-Tsin Wong and Zhi-Qiang Liu, 2012. "Perceptual thumbnail generation," In: Ratislav Lukac (editor). *Perceptual digital imaging: Methods and applications*. Boca Raton, Fla.: CRC Press, pp. 193–221.

Vilem Flusser, 2011. *Into the universe of technical images*. Translated by Nancy Ann Roth. Minneapolis: University of Minnesota Press.

Lucas Hilderbrand, 2009. *Inherent vice: Bootleg histories of videotape and copyright*. Durham, N.C.: Duke University Press.

Kristen Lubben (editor), 2011. *Magnum contact sheets*. London, Thames & Hudson.

Rosa Menkman, 2011. *The glitch moment(um)*. Amsterdam: Institute of Network Cultures, at [https://networkcultures.org/uploads/NN%234\\_RosaMenkman.pdf](https://networkcultures.org/uploads/NN%234_RosaMenkman.pdf), accessed 2 January 2017.

John Durham Peters, 2015. *The marvelous clouds: Toward a philosophy of elemental media*. Chicago: University of Chicago Press.

Daniel Rubinstein and Katarina Sluis, 2013. "The digital image in photographic culture; Algorithmic photography and the crisis of representation," In: Martin Lister (editor). *The photographic image in digital culture*. Second edition. London: Routledge, pp. 22–40.

Graham Saxby, 2005. "Thumbnail," In: Robin Lenman (editor). *Oxford companion to the photograph*. Oxford: Oxford University Press.

Ben Shneiderman, 2002. *Leonardo's laptop: Human needs and the new computing technologies*. Cambridge, Mass.: MIT Press.

Yale Song, Miriam Redi, Jordi Vallmitjana and Alejandro Jaimes, 2016, "To click or not to click: Automatic selection of beautiful thumbnails from videos," *CIKM '16: Proceedings of the 25th ACM International on Conference on Information and Knowledge Management*, pp. 659–668. doi: <https://doi.org/10.1145/2983323.2983349>, accessed 15 September 2017.

Danny Sullivan, 2016. "Google now handles at least 2 trillion searches per year," *Search Engine Land* (24 May), at <http://searchengineland.com/google-now-handles-2-999-trillion-searches-per-year-250247>, accessed 17 January 2017.

Nanna Thylstrup and Stina Teilmann, 2017. "Thumbnail images: Uncertainties, infrastructures and search engines," In: *Digital creativity*. doi: <http://dx.doi.org/10.1080/14626268.2017.1375961>, accessed 26 September 2017.

Rachel Simone Weil, 2014. "No bad memories: A feminist, critical design approach to video game histories," M.F.A. thesis, University of Texas at Austin, at <https://repositories.lib.utexas.edu/handle/2152/26343>, accessed 17 January 2017.

Mark Weiser, 1991. "The computer for the 21st century," *Scientific American* (September), pp. 78–89; version at <https://web.stanford.edu/class/cs240e/papers/weiser.pdf>, accessed 15 September 2017.

Allison Woodruff, Andrew Faulring, Ruth Rosenholtz, Julie Morrision and Peter Pirolli, 2001. "Using thumbnails to search the Web," *CHI '01: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pp. 198–205. doi: <https://doi.org/10.1145/365024.365098>, accessed 15 September 2017.

---

## Editorial history

Received 1 May 2017; revised 25 August 2017; revised 30 August 2017; accepted 14 September 2017.

---



This paper is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/).

Negotiating the thumbnail image: The transformative power of search engines and their "good enough" aesthetics

by Nanna Thylstrup and Stina Teilmann.

*First Monday*, Volume 22, Number 10 - 2 October 2017

<http://firstmonday.org/ojs/index.php/fm/rt/printerFriendly/7869/6549>

doi: <http://dx.doi.org/10.5210/fm.v22i110.7869>

# **DB Error: Query execution was interrupted**