

Chapter 2

The Internet as Space

Abstract This chapter will, first, present the general notion of image space, and a scalar model differentiating among its four visual classes: virtual space (visual presentations of real space and material artifacts), cyberspace (digital communications and information media), the Internet (digital communications and informational spaces), and Internet screen-space (users' visual interface with the Internet). This scalar model leads from the wider to the specific. This differentiation will be followed by discussions of cyberspace and Internet screen-space geography.

Keywords Image space • Virtual space • Cyberspace • The internet • Internet information space • Internet communications space • Internet screen-space

Our journey into the specific geographical dimensions of the cyberspatial Internet will begin in this chapter, with an exploration of the most basic geographical concept, namely space, as manifested in image spaces. Thus, we will discuss, first, the rather wide and general notion of image space. We will then move to the presentation of a scalar model that will differentiate among its four visual classes, from the wider to the specific. First, virtual space—the visual presentations of real space and material artifacts. Second, cyberspace—the digital communications and information media. Third, the Internet—or digital communications and informational spaces, and finally and fourth, Internet screen-space—the visual interface between Internet information and communications spaces and their users (Fig. 2.1).

In this scalar model, virtual space constitutes the widest term, hence including cyberspace, which on its part includes the Internet and its screens, or its user interfaces, which we call the Internet screen-spaces. The discussions of these four classes of image space will focus on differences among them, as well as on relationships among them, rather than attempting to put these four classes into the context of spatial theory concepts that were developed originally for real space. Following the exploration of the scalar model for image spaces, we will continue our discussion with a discussion of the geographies of Internet information, communications and screen spaces.

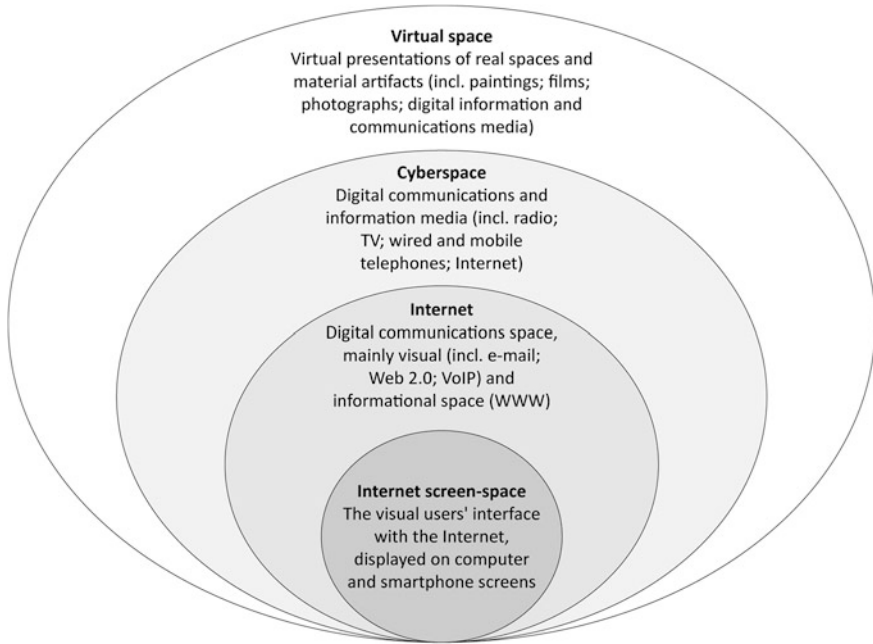


Fig. 2.1 Image space classes. *Source* Based on Kellerman (2016), Fig. 1 (with permission)

2.1 Image Space

The common denominator among virtual, cyber, and Internet spaces is that they all constitute image spaces. Images are normally conceived of as visual representations of material entities, but as Jay (1994, pp. 8–9) noted: ‘There is [therefore] something revealing in the ambiguities surrounding the word ‘image’, which can signify graphic, optical, perceptual, mental or verbal phenomena’. Aumont (1997) distinguished among three channels for image space expressions: spectators’ perceptions, image transmission apparatuses, and the images themselves. For the latter class he focused on painting, film and photography, noting generally, ‘that space is a much more complex category than its iconic representation’ (p. 160), and thus requiring several adjustments for its image presentation, notably the need to use perspective.

Within geography, images were initially attributed to mental images, i.e. imagined spaces, and their visual expression through mental maps (Phillips 1993; Chap. 6). Later on, interest moved to space in pre-cinematic and cinematic film technologies (e.g., Doel and Clarke 2005), and even to slides (Rose 2003) and diagrams (Petersson 2005). The common thread among these latter explorations is their engagement mainly with the expression and treatment of real space within certain media, rather than on these media as constituting spaces by themselves.

Our interest here is to look at classes of images as spaces by themselves, with a distinct focus on Internet spaces. Ash (2009) paved an initial road in this direction in his study of video game screens as spaces. He assumed that space in visual images ‘can be considered as a surface, a flat image presented on the screen’ (Ash 2009, p. 211). Ash (2009) further developed several notions regarding visual image spaces, tying together the distinct classes that Aumont (1997) proposed and that we mentioned before. First among these notions is that images represent the real world, even if in skewed, distorted, or imagined forms, but simultaneously they also produce and create spaces. Second, ‘the ‘being’ of images consists of both a *materiality* and a *phenomenality*, which both act in concert, as the conditions for being able to ‘see’ or experience the image at all’ (Ash 2009, pp. 2107–2108). Third, image spatiality is an existential one, because it is constructed by the activities and engagement of image users. Image spaces constitute, therefore, two things at once: imagined spaces as perceived by image users, and material or visual images representing real space.

Image spaces include also metaphorical spaces, traditionally referring to the spaces that are presented and verbally described in non-visual literal texts, mainly in prose and poetry writings. Contemporarily, though, metaphorical spaces may include also digital visual entities and representations, notably the Internet information and communications spaces. Hence, we noted already the wide application of spatial notions for the use of the Internet (e.g., site, home, surfing, etc.) (see e.g., Schlottmann and Miggelbrink 2009). In addition to these metaphorical spatial expressions for the very use of the Internet, the visual expression of the Internet through Internet screens may also be considered as image spaces. Thus, we may differentiate among four classes of virtual image spaces, nesting within each other: virtual space; cyberspace; the Internet information and communications spaces; and Internet screen space. We will now examine these four classes of visual image spaces, focusing on their specific qualities and on geographical notions pertaining to the understanding of each of them.

2.2 Virtual Space

The two terms of cyberspace and virtual space may seem at first glance as synonyms, notably if both terms are perceived as being exclusively digital (see e.g., Graham 2005; Tranos and Nijkamp 2013). Kinsley (2014, p. 365), in his review of virtuality, noted the nuanced range of interpretations for virtual space as a digital entity. Thus, ‘the ‘virtual’ of ‘virtual geographies’ tends to mean simulation of a kind of digital liminality, akin to a space ‘between’ screen and body, data and machine’ (see also Crang et al. 1999, p. 6).

Following Ettlinger (2008), and see also the discussion by Grosz (2001, pp. 78–81), we suggest that virtual space constitutes a much wider entity than cyberspace, so that digital cyberspace constitutes its subset. As Ettlinger (2008) claimed ‘virtual space is the visible world of pictorial images: paintings, films, photographs, TV programs, video games, or any other pictorial medium—i.e. physical devices that allow us to experience through them something that is not physically there’ (p. xi). Thus, ‘virtual space is not the world of dreams’ and ‘virtual space is not a hallucination’ (p. 31), whereas ‘referring to the Internet in terms of a space, [therefore,] is valid only metaphorically—as a conceptual type of space’ (p. 27), and ‘cyberspace with all its complexity and elaboration is only a specifically-defined subset of virtual space’ (p. 33).

Still, though, the very nature of the virtual, and even more so its geography, are complex, since it is difficult to interpret them along the classical differentiation between abstract and relative spaces (see e.g., Curry 1998), with virtual space possibly presenting a merge between these two classes of space (Hillis 1999, p. 77). The experiencing of virtual space might get close to but will never be identical to that of real space (Crang et al. 1999). The interpretation of the virtual as something ‘which is not physical but emulates the physical’ was attributed by Farman (2012, p. 37) to 17th century Christianity.

Virtual space is coupled, by its very nature, with the process of virtualization, studied at the time by Lévy (1998), who noted that ‘when a person, community, act, or piece of information are virtualized, they are ‘not-there’, they deterritorialize themselves’ (p. 29), and ‘if cyberspace results from the virtualization of computers, the electronic highway reifies this virtual world’ (p. 160). Virtualization, thus, amounts to a *process* of turning things into the virtual, and this process is independent of cyberspace as a specific class of virtual *entity*. In other words, virtualization implies a *process* of transformation of things, whereas cyberspace denotes a *condition* of visual exhibition of virtual things, mainly through television and the Internet. Hence, turning something into a virtual condition does not necessarily imply its being presented over cyberspace, but the opposite case is true: things which are presented on cyberspace are always virtual.

2.3 Cyberspace

The essence of our following discussion is an attempt to cope with the question: ‘Is cyberspace a kind of space?’ (Adams and Warf 1997, p. 141), notably since ‘cyberspace has been considered a ‘parallel’ universe to our own’ (Grosz 2001, p. 76). In its being a space for itself, cyberspace has been viewed as neither absolute nor relative (Wang et al. 2003). Gibson (1984) originally proposed the term ‘cyberspace’ as a science-fiction notion, and this notion was applied later to computer-mediated communications, as well as to virtual reality technologies (Kitchin 1998a, p. 2). The specific conceptions of cyberspace as a geographical concept and entity have received wide interpretations. Cyberspace was, thus, seen

as synonymous with information space in general (as reviewed by Thrift 1996). It was further viewed as a space ‘invisible to our senses’ (Batty 1993, p. 615), and it was accepted as a geographic metaphor for disembodiment (Adams 1997; Tranos and Nijkamp 2013). It was also related to as ‘a multi-media skein of digital networks’ (Graham 1998, p. 165). In addition, Thrift argued for information spaces to ‘signal new spatial logics which respect none of the apparently Newtonian constructs of space... They are connected to the rise of images and signs as the means by which our society makes sense of itself’ (Thrift 1996, p. 1467). Side by side with these non-material views of cyberspace, it is still spatially and materially based through its real space infrastructure (Zook et al. 2004), and it further interacts with real environments (Light 1999; Graham 1998).

Cyberspace has also been variously defined from spatial perspectives since the early 1990s (see also Kellerman 2014):

1. *Artificial reality*: ‘Cyberspace is a globally networked, computer-sustained, computer-accessed, and computer-generated, multidimensional, artificial, or ‘virtual’, reality’ (Benedikt 1991, p. 122; see also Kitchin 1998a, p. 2).
2. *Interactivity space*: ‘Interactivity between remote computers defines cyberspace...cyberspace is not necessarily imagined space—it is real enough in that it is the space set up by those who use remote computers to communicate’ (Batty 1997, p. 343–344).
3. *Conceptual space*: ‘The *conceptual space* within ICTs (information and communication technologies), rather than the technology itself’ (Dodge and Kitchin 2001, p. 1).
4. *Metaphorical space*: ‘the idea of ‘cyberspace’ is deployed as an inherently geographic metaphor’ (Graham 2013, p. 178).

The first three definitions locate cyberspace within the wide sphere of information technologies, hence including also communications media, i.e. radio, television, and fixed and mobile communications technologies, all of which were originally invented prior to the invention of computers in the late 1940s. The Internet is, therefore, a different medium in this regard, since it has been computer-based as of its original innovation in the 1960s. All of these four definitions relate to cyberspace from the perspective of users’ experiences, with cyberspace being viewed as an artificial reality, as a communications platform, or as conceptual or metaphorical spaces.

As such, the four definitions may be considered as complementary to each other, so that cyberspace may be viewed in general as constituting simultaneously a virtual, interactive, conceptual and metaphorical spatial entity. Such a pluralistic approach to the nature of cyberspace is in line with Strate’s (1999, p. 383) suggestion that cyberspace is ‘better understood as a plurality rather than a singularity’. Strate (1999) further proposed to rank the meanings or building blocks of cyberspace through ranked orders. Zero order refers to the ontological nature of cyberspace as a virtual reality. First order cyberspace relates to the physical space of its hardware, side by side with its being a conceptual space that mediates between its

ontological and physical dimensions. Finally, second order cyberspace constitutes a synthesis between the two lower orders.

So far, we have viewed cyberspace as a space for itself, but cyberspace can also be viewed from additional perspectives, as well. Thus, cyberspace may be perceived as exhibiting representations of real space through maps, pictures and graphs, used for the study of real space, and for navigation in real space (Zook and Graham 2007; Zook et al. 2004). Cyberspace was further defined from non-geographical user-oriented perspectives. Hence, for Mitchell (1995, p. 8) ‘cyberspace is profoundly *antispacial*’, whereas for Mizrach (1996) it constitutes a ‘consensual hallucination’. Thus, ‘under the right conditions, cyberspace becomes a dream world, not unlike the world which emerges when we sink to sleep’ (Suler 1999). However, Internet users can consciously navigate within the publicly available cyberspatial world, the Web, as opposed to dreamers’ unconscious navigations within their dream-cyberspace.

Side by side with these non-spatial approaches to the nature of cyberspace, we noted already the application of geographical-spatial daily notions and metaphors for the construction, naming and use of cyberspace, notably for the use of the Internet. This use of geographical terms for the very operation of the Internet received a universal adoption, given the everyday convenience and familiarity of people with real space. Hence, the emergence of Internet terms such as site, browsing, and moving (Wilken 2007; Graham 2013).

The wide adoption of spatial terms for the routine use of cyberspace via the Internet attests to a process of spatialization (Kellerman 2007), implying the adoption of space as a metaphor for cyberspace and its operation. Couclelis (1998) noted on this use of metaphors that it involves ‘the mapping of one domain of experience into another, more coherent, powerful, or familiar one...the metaphor performs a cognitive fusion between the two, so that the things in the source domain are viewed as if they really belonged in the target domain’ (pp. 214–215). Wide-ranging metaphors were generally termed by Lakoff and Johnson (1980, p. 14) as *orientational metaphors*, and this term seems an obvious case for the adoption of the wide-ranging spatial metaphors for cyberspace and its use. The emergence of the spatial metaphors for cyberspace was further claimed to be founded on the human experience since ‘early in life and is essential for survival’ (Tversky 2000, p. 76; see also Couclelis 1998). In addition, the spatial metaphor has turned out to be convenient for numerous dimensions of information use: organization, access, integration, and operation (Tversky 2001).

2.4 The Internet

The Internet is foremost a specific cyberspatial communications and informational technology, typified by visual presentations of information to its subscribers. As for its status *vis-à-vis* the real space world, it was suggested that ‘the Internet can be thought of as a space attached to the earth’ (Wang et al. 2003, p. 383). We traced

briefly the history and development of the Internet in Chap. 1 (see also Kellerman 2002), so that it will suffice here to note several classifications for its internal structure. Most basically, and as mentioned already in Chap. 1, the Internet can be divided into its two major functions or components: information space consisting mainly of the Web and its websites, and communications space, which includes mainly e-mail platforms and Web 2.0 social networking applications, led by Facebook and Twitter (Kellerman 2007). We will discuss these two classes of space in some detail in the following two sub-sections, alongside with the Internet screen spaces, which serve as user interfaces with the information and communications spaces. It is important, though, to note once again that both the information and communications spaces of the Internet are virtual, and their constitution as spaces is rather metaphorical. These two metaphorical spaces become visually reified to their users through the Internet screen spaces.

Another basic classification for the Internet is its division into domain names marked by organizational and national signifiers/codes. These codes comprise an integral component for both the specific website addresses and the personal communications addresses (see e.g., Wilson 2001; Chap. 3).

The Internet has been widely viewed as a unique social landscape, being comprised of spatial elements. For example, ‘the Internet, as a platform for *virtual interactions* among individuals and organizations, has necessarily a geographical component’ (Tranos and Nijkamp 2013, p. 855), and ‘the only communication medium that rivals the topological flexibility of computer networks is place itself’ (Adams 1998, p. 93). A growingly important element of Internet communications, notably since the wide adoption of social networking platforms (such as Facebook), is the ability for users to communicate anonymously and in most egalitarian ways. As was noted already by Lévy before the construction of Web 2.0, ‘here we no longer encounter people exclusively by their name, geographical location, or social rank, but in the context of centers of interest, within a shared landscape of meaning and knowledge’ (Lévy 1998, p. 141). Moreover, ‘cyberspace provides social spaces that are purportedly free of the constraints of the body; you are accepted on the basis of your written words, not what you look like or sound like’ (Kitchin 1998b, pp. 386–387; see also Mizrach 1996).

As mentioned already previously, the Internet consists of three types of spaces: information, communications, and screens. We will look now at each of these spaces separately.

2.4.1 Internet Information Space

We noted already that information space refers to digital information sets or systems, consisting of information organized within metaphorical spatial contexts such as websites, and, hence, involving the use of some additional geographical metaphors such as home, and navigation/surfing. However, information cyberspace includes also digital information sets, such as data archives and library catalogs

(Fabrikant and Battenfield 2001; Couclelis 1998). All the information sets that are included in the Internet information space are textual and/or graphic in nature, and they have some constancy in terms of their virtual availability to users, so that they may be recalled by their users whenever they find it necessary. Most of these information files are meant to be shared by users: either the general public through the Internet, or segmented and permitted users only, through Intranets. Contemporary search engines have allowed for easy access to websites and files, and as we will discuss in Chap. 4, Google has emerged as a leading service in this regard, providing also searches into more specialized information systems, such as satellite images, and scientific articles and books. Google was, thus, assessed as a megaproject within another megaproject (the Internet) (Paradiso 2011).

2.4.2 *Internet Communications Space*

The second class of cyberspace is communications space, referring to the cyberspace of individuals who communicate with each other via numerous modes of Internet communications, thus affording individuals with their extensibility (Kellerman 2007). First among these communications modes are video calls, which obviously transmit the images of the callers themselves, but they further transmit images of some real space, visible in the background of the communicating parties. Videophones have been introduced repeatedly as of the 1960s, but have not been widely adopted until the wide adoption of broadband in general, and of smartphones connected to broadband transmission as of the 2000s, in particular.

The second mode of cyberspatial communications is verbal messaging, beyond the fixed-line audial telephone, which was introduced already in 1876, and has been gradually adopted in time and space since then (Kellerman 2006). The currently available rather numerous media for cyberspatial communications have been introduced and adopted as of the second half of the previous century, and particularly during the first decade of this century. These include e-mails (universally available as of 1994), faxes (commercially available as of 1964, and originally using fixed-line telephones), SMSs (Short Messaging Service) (as of 2000), chat messages transmitted through networking platforms (as of 2004), and Internet audial telephone calls through VoIP (as of 2003). This variety of interpersonal verbal communications technologies permit Internet subscribers to make use of both audial and written communications, side by side with their possible choice between online and delayed communications for written messages.

The Internet communications space is mostly interpersonal or shared by small groups such as most Whatsapp groups, though it may also be widely accessible to larger groups through other social networking systems, such as widely distributed blogs, or through networking platform, such as Myspace, Facebook, Twitter, and Usenets, or even through SMSs. Much of the contents of communications cyberspace is not recorded, and if it is recorded, then the contents is meant to be shared by the communicating parties only. However, so-called ‘viral’, swift and wide

transmission of messages, transmitted through wide lists and groups, may cause a wide distribution of information, sometimes originally not been meant for wide distribution. Such viral distributions have brought about new social phenomena, such as shaming, and exposures of intimate pictures and information, side by side with stronger political awareness of the masses.

The two Internet categories of information and communications spaces are frequently interfolded, for example when website users send messages through the website itself to its owners, rather than separately through e-mail systems, or when e-mails and messages transmitted through social networking platforms include links to pictures, websites, and/or data. This interfolding and even fusing of the Internet information and communications spaces attest to the oneness of the Internet, at least from its usage perspective. However, each of the two cyberspace classes may frequently function independently of each other, for instance audial personal communications normally do not involve a simultaneous transmission of textual datasets.

2.4.3 *Internet Screen-Space*

Internet screen space constitute the visual interface between the Internet information and communications spaces and their users, and these digital spaces are displayed on computer and smartphone screens. Computer screens *per se* have already been explored from phenomenological (Introna and Ilharco 2006), as well as from ethological perspectives (Ash 2009), and we would like to add here a geographical framework for the understanding of the rather specific Internet screens. ‘Online interaction is currently dominated by visual interfaces, rather than aural, tactile, or olfactory interfaces’, and these digital spaces lead to the spatialization of non-spatial data (Zook et al. 2004, pp. 159–160; see also Fabrikant 2000). The comprehensive nature of the Internet as an informational and communications system implies that screen-spaces may consist of all possible visual presentation types: texts, pictures, maps, landscapes, and combinations among these elements.

Internet screen spaces, by their very nature, are not stable like printed or painted virtual spaces, and they may disappear by pre-programmed commands, or as a direct response to instant actions performed by users. Internet subscribers may use routinely and repetitively the same specific screen-spaces, such as their homepages, news services, and banking and shopping websites, and these repetitive uses present to the users pages with fixed structures and colors, but with some continuously contents changes. Thus, Internet users may find it difficult to cognize and eventually draw cognitive maps for these instantly appearing and disappearing virtual landscapes and informational screens (see Chap. 6 for discussion). More generally, Kwan (2001) noted in this regard, that for real space, space and its maps are two completely separate entities, whereas for Internet screen spaces, space and its maps may converge. Thus, ‘cognitive communications cyberspaces are personally unique, and cannot be aggregated, whereas cognitive maps relating to a specific

area may be compared and conclusions on a wider societal knowledge of an area drawn' (Kellerman 2014, p. 9). In telephone calls, notably in video calls, 'the virtual is imagined as a 'space' between participants, a computer-generated common ground which is neither actual in its location or coordinates, nor is it merely a conceptual abstraction, for it may be experienced 'as if' lived for given purposes' (Shields 2003, p. 49).

The use of the Internet, which implies the visual exposure of individuals to cyberspace, has involved simultaneous co-presence or telepresence of users in fixed physical and virtual spaces (see e.g., Kaufmann 2002, p. 28; Urry 2000, p. 71; Lévy 1998), and we will discuss this emerging routine of co-presence in detail in Chap. 5. Graham (2013) mentioned that cyberspace has been 'conceived of as both an ethereal dimension which is simultaneously infinite and everywhere... and as fixed in a distinct location' (p. 179), but he objected this view.

2.5 Image Spaces: Virtual Space, Cyberspace, the Internet and Internet Screen Space

In the discussions so far of the four classes of visual image space, namely virtual space, cyberspace, the Internet two spaces and Internet screen space, we have seen that each of them constitutes a geographical entity with some geographical, even if only metaphorical, qualities. We have further noted that virtual space is the widest entity, thus including within it both cyber and non-cyber spaces. Cyberspace, as the widest digital communications sphere, includes within it the Internet and its information and communications spaces, with Internet screen spaces constituting the visual interface of the Internet with its users. Internet screen-spaces enjoy a multifaceted nature: they are virtual, since they may visually present real space and material artifacts; they are cyberspatial, as they comprise a component of a digital communications medium; and finally they are Internet-based, because they serve as the visual interface of the Internet with its users. In the following chapters, we will move to discussions of real space dimensions and parameters that will be proposed for the interpretation and analysis of the Internet information and communications spaces, as well as for the Internet screen spaces.

2.6 Conclusion

In this chapter, we have presented image space as consisting of four visual classes: virtual space, cyberspace, the Internet two spaces, and Internet screen spaces. We interpreted virtual space as the visual presentations of real space and material artifacts in all forms, mainly on paper and through cyber, whereas cyberspace was viewed as being the specific subset of virtual space, with such presentations made

through digital media, notably through the Internet. Thus, as such, the Internet constitutes a subset of cyberspace, which on its part is a subset of the wider virtual space. This differentiation has led us to the presentations of the even more specific Internet information, communications, and screen-spaces as subsets of the Internet.

Cyberspace has been spatially defined, in this chapter, from the perspectives of artificial reality, interactivity, and conceptual and metaphorical spaces, and it was shown to have a visual dimension through several media, including the Web and the communications platforms of the Internet, as transmitted via Internet screens. As a spatial experience, the exposure and use of cyberspace through the Internet involves co-presence in both cyber and real spaces, low cognitive mapping ability of individuals for cyberspatial landscapes, and personal exposure to the facilitation of communication through egalitarian and global interaction platforms.

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