The Nature of Data: Illusions of Reality

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Abstract

The nature of data has changed as human technology has evolved. 'Natural' analogue data stimulate our senses, whilst machine produced data provides an intermediary for natural or artificial data to our senses. In the age of the cyborg (a machine with human attributes) and the bionic person (a human with machine attributes), it is possible for data totally alien from 'natural reality' to be fed directly to the brain so by-passing the senses. This is a new form of reality, which lends itself to manipulation of a kind never experienced before. The dreams of deceivers may yet be realised on a mass scale.

Keywords: Deception, illusion, reality, cyborgs, bionics, data, mobile computing.

Introduction

When the French philosopher, Jean Baudrillard (1995), wrote a series of articles called 'The Gulf War Did Not Take Place', he did not mean that the events of that conflict did not occur, but that the reality of the situation had been changed by the media. The perception that what happened in the Gulf was a 'real war' was controlled by the data and context set by the media and fed to the consumer. The implication is that our senses relating the 'real' world to our brains is no longer the primary determinant of perception. The development of wireless technologies and its associated software and hardware has brought the spectre of the true human machine. A mobile set of gadgets could allow you to accentuate your senses (Marks, 2000; Gershendfeld, 1999). Some examples are:

- Infra-red/star light vision.
- Ability to 'smell' other humans.
- Face recognition software combined with hardware that can whisper the name of the person standing in front of you.
- The ability to find out where you are, and call up a map to be display on your retina.
- The ability to send real-time movie images of your own situation

Who could resist these extra sensory abilities? The applications for these technologies are enormous. Yet, so is the ability to deceive. As humans become almost totally dependent on digital data for their personal, operational lives the consequences of deception increase exponentially.

Yet, the implications of contemporary technological developments take digital data into another realm. At one level, the ability to create virtual world where you can have a conversation with someone in Sydney whilst you are in Prague, *and* at the same time touch and feel that person in the bubble of a virtual world (Davenport, 2000) can stretch the abilities of those who deceive but also provide enormous potential. Virilio (1995) calls this type of process the *automation of perception*. It is a situation where "*paradoxical logic* emerges when the real-time image dominates the thing represented, real time subsequently prevailing over real space, virtually dominating actuality and turning the very concept of reality on its head" (*ibid*, p.63). He goes onto to argue very much like Baudrillard (1995) that in this real time world, its very 'virtuality' lends itself to disinformation (deception).

An even higher level of dependence is the creation of the true human-machine – the cyborg. The physical merging of mind and machine lifts the data processed by our brains from photons, volatile chemicals, and pressure to pure digital data. In the UK, a married couple has implanted microchip directly into their nervous systems (under the arm) to be able to 'feel' their respective 'feelings' (Press Association, 2000). Digital data now totally replaces 'natural' inputs; this is truly the digital person. Some of the conse-

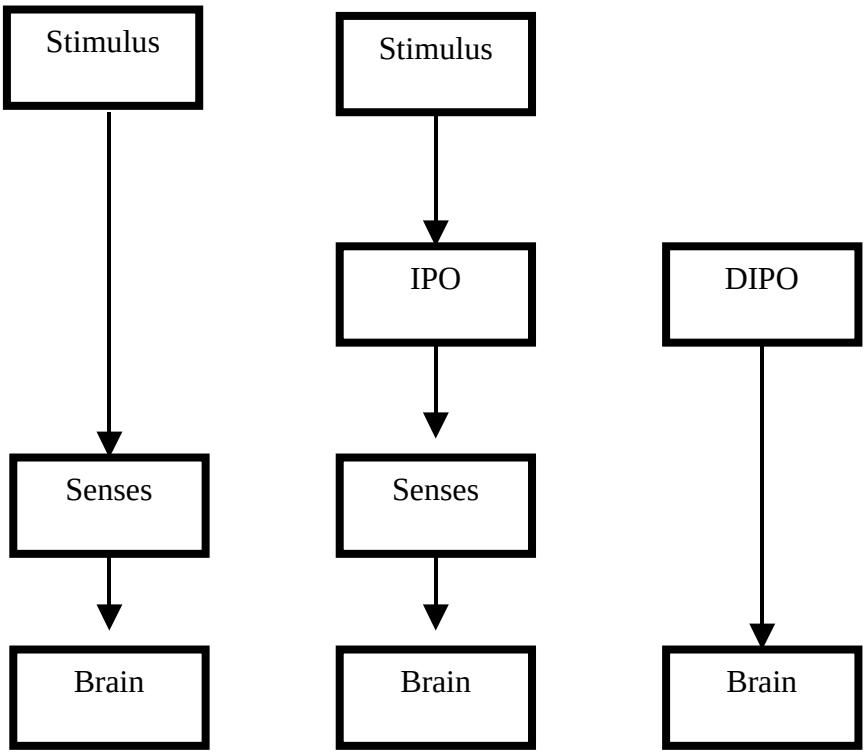

Figure 1: The development of human/machine data exchange

Key: IPO = Input/Process/Output machine
DIPO = Digital IPO

quences of this digital world where many humans are networked and receive purely digital data into their nervous systems are easy to imagine. Feeding 'false' or manipulated data into a system such as this would have enormous implications. Ironically in a networked world, the digital enhancement of the individual would make each one vulnerable to being turned into the clone (in terms of behaviour) of everyone around. Whilst the previous argument sounds more like science fiction, many of the principles are not.

The Nature of Data

The nature of data in relationship to human perception is illustrated in Figure 1. The 'normal' path of data is illustrated in a), where analogue environmental data is sensed by the body and messages sent to the brain where it is interpreted (of course, this is not a simple process). The option b) represents the situation where a machine which (usually) improves human sensory perception by passing an analogue message to the senses via an interface. These are sent to the brain. For instance, this could involve and infra-red or ultra-violet sensor producing images, or a device sensing auditory stimuli out of the natural human range. The third option c) is the cyborg situation were a digital signal creator feed data straight to the brain. This latter option fundamentally separates the brain from its physical environment. Spinney (2000) gives an example of experiments of technological developments to aid the blind to 'see' by feeding digital inputs directly to the visual cortex from a digital visual receptor.

Whilst the extension of the human senses of human senses with input-output devices can improve environmental awareness, the direct feeding of data to the brain can radically decrease the correlation between cognition and 'reality'. All of these situations are prone to manipulation. However, the more removed from the physical world a human becomes the more the manipulation will not be noticed. The senses will be divorced from reality, To create a new 'truth' divorced from the physical only the input devices feeding data will need to be programmed. In a wire-

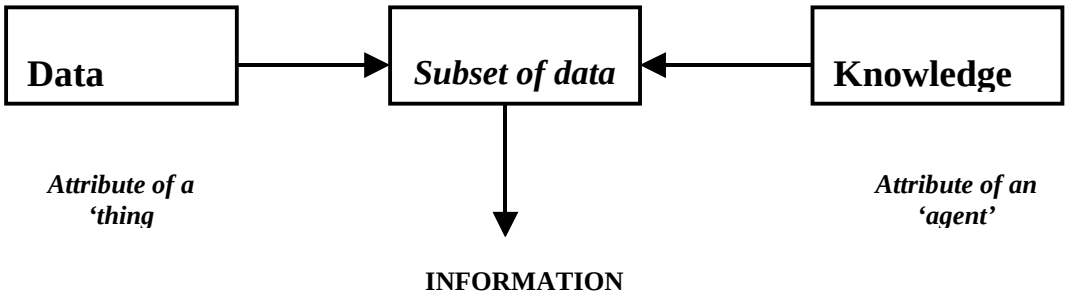

Figure 2: Boisot's model**.**

less, networked world with personalised, mobile digital devices, the potential becomes enormous. The advent of a collective **e-**consciousness (or unconsciousness) could be possible. Control of the network could allow the development of contrived *memes* (see Lynch, 1996; Blackmore, 2000) in the population.

Thus, the evolution of human perception has gone from direct environmental stimuli and interpretation; to indirect, abstract stimuli, such as writing and icons (both examples of figure 1a); to machine sensing feeding human senses (figure 1b), to machine sensing and abstract creation of data fed directly to the brain (figure 1c). Principles of Deception

Manipulating data to produce desired outcomes has been routinely practiced since the dawn of history. Individuals and organisations choose data, which suits the image they want to be portrayed. For instance, soldiers camouflage weapons to avoid detection, or disperse false information to conceal intentions. Photographic images have been faked to alter 'history' for many years (Brugioni, 1999). However, the advent of digital data has made manipulation of images, text, sounds, and even smells much easier. Innovations in the creation perceptual peripherals (Turk and Robinson, 2000) has made the impact of manipulated data reach a profound level.

In this paper, deception is defined as *the deliberate alteration of data or a situation's context to promote a desired outcome*. Therefore, it does not include self-delusion, or a person's natural tendency to use mental models to interpret things in an individual way. The definition places emphasis on a second party being involved, where that a person or organisation is consciously trying to create deception.

The word 'deception' tends to infer a negative motive. For instance the following words were derived from the Thesaurus of the MS Word package used to create this document: illusion, sham, stratagem, hoax, cheat, lie, delude, trick, betray, swindle, hoodwink, defraud, con, dupe, and mislead. Many of these words indicate an action and/or a negative motive. However, it is the motive, which ultimately decides the ethics of a situation where a deception is used.

To understand the fundamental of deception, it is necessary to define data, information, and knowledge. Figure 2 illustrates Boisot's (1998) broad concept of the meaning of these three words. In this model, data is defined as the attribute of a 'thing' such as, its colour, shape, or its value. However, knowledge is an attribute of an 'agent' (usually this means a human, although it can be argued that intelligent machines can have knowledge). Knowledge is a product of experiences, education, age, gender, culture, and many of the other factors that make up individuals, as well as the context of the immediate situation. Thus, humans derive information by using their knowledge to select appropriate data to provide them with information. Hence to deceive, it is necessary to alter data by addition, deletion, or modification and/or alter the context in which the data is interpreted.

Bowyer (1982) classifies deception into two main types:

- Level 1: Hiding the real
- Level 2: Showing the false

It should be pointed out that 'showing the false' also involves 'hiding the real'.

Figure 3 details the types of deception. Whilst this paper is too short to go into each method of creating an illusion by 'feeding' data to an unsuspecting person, the variety of techniques to do so can be left to the imagination. Also, there is the potential to manipulate the context by which

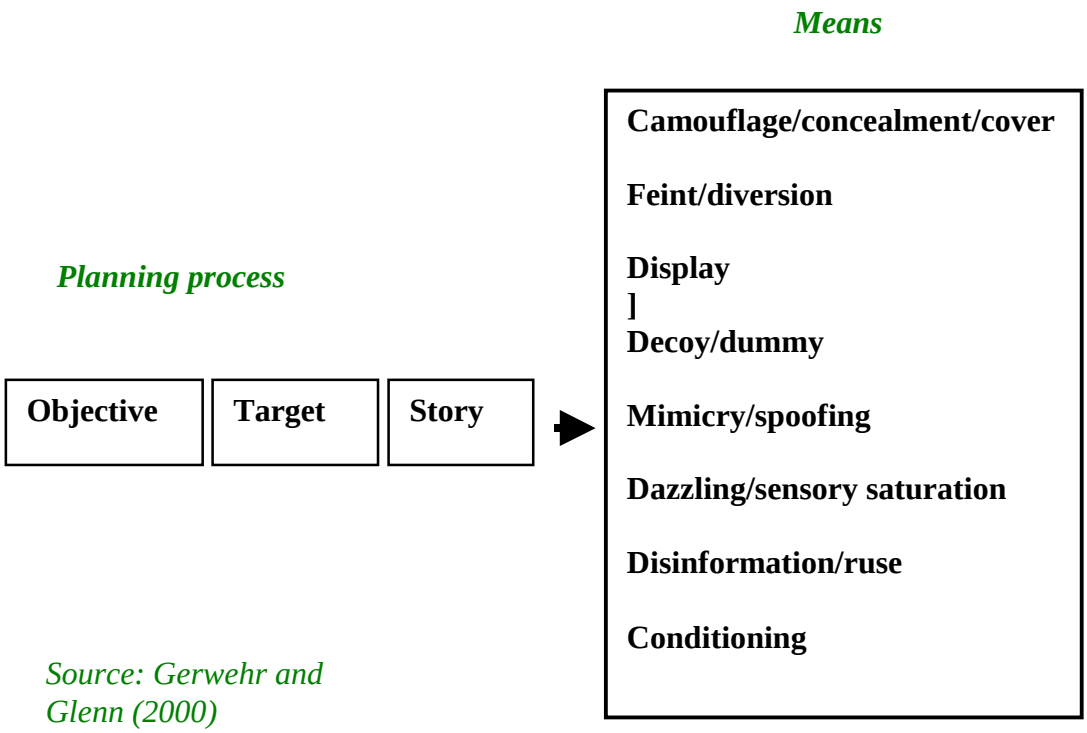

Figure 3**:** Types of deception

data is interpreted. In the extreme cyborg case (figure 1c), the data and context are inseparable.

Figure 3 also illustrates the process of deception. There must be an objective, a target and a story to tell. The type of data (environmental, machine, or, direct digital) will determine the easiest and most effective method at any given time.

Of course, there are two sides to a deception: the deceiver and the deceived. The deceived should use a dynamic process to ensure the integrity of the data received, processed, stored, and used. There should also be an awareness of the ability of other to manipulate perceptions. Table 1 is derived from Signal Detection Theory and is a modified form of a table in Wickens (1992).

Table 1 shows that if a message is manipulated and that message is accepted, then deceit has occurred. This is deceit by altering data. If a message (data) is unaltered and is not accepted then deception may also have occurred. If this has occurred, then it is deception by altering the context (knowledge) in which the deceived interprets it. In the cyborg/digital case (figure 1c), the manipulated message is almost certain to be accepted as the message is almost the interpretation.

The potential to deceive in an environment where humans are reliant on personal and networked digital devices are substantial. The ease with which individuals and sets of people (both small and large) can be targeted could put into the hands of any able group enormous power to deceive. A combination of implanted logic into the devices, surveillance strategies, and selective data sent to the devices could manipulate the behaviour of individuals with ease. Reality is modified.

Contemporary Examples of Deception

Even with contemporary, less developed and exotic systems, the practice of deception is present. The digital nature of Web sites and their almost universal accessibility make them prone to attack. Some examples of the types of deception listed above will be illustrated. However, it

	Message untouched	Message manipulated
Message accepted	X	**Deceit has occurred**
Message rejected	**Deceit may have occurred**	X

Table 1: **Message acceptance and deception**

Figure 4: **A hacked Indonesian site**

should be noted that a really successful deception is one that is unrecognised. Whilst the examples below are not sophisticated attacks, the ease of manipulation of digital data is illustrated.

Figure 4 shows a hacked site 'mimicking' the real thing. It shows an Indonesian site, which was attacked by Portuguese hackers sympathetic to the East Timorese cause during the conflict in the late 1990s. As stated previously, these types of attacks hardly go unnoticed. A greater effect can be obtained from clever changes, whichbe undetected, but at the same time produce effects by insinuation, and emotive-behaviour modifying content.

'Inventing' or the creation of a new reality is the realm of propagandists, public relations, and advertising people. The digital, virtual World Wide Web is an ideal medium for it. Figure 5 shows an attempt by the 'Real IRA' to evoke some kind of emotive response. Propaganda images are not new but the ability to communicate them rapidly and to a mass audience is. It is no longer the prerogative of those who control the mass media.

We are now facing a situation where there is data available to 'prove' whatever point is required and the 'image' it seems to send might not be what it seems and, in fact, could be the complete opposite.

Conclusion

The nature of human data gathering has evolved from the original environmental change to sense, to abstraction to senses, to machine produced environmental/abstract data to senses, to become artificial data direct to brain. Each level of human-data interaction can be manipulated for external purposes. This short paper exposes some of the implications to 'reality' and the nature of the data eventually received by the human brain.

The potential to manipulate this data has changed the relationship between our senses, environmental reality and our brains' functioning. Data is no longer just environmentally

Figure 5: An Emotive 'Real IRA' image

created photons, pressures, or volatile chemicals, but artificial recreations of these stimuli by devices. In the extreme case of the brain being directly stimulated by digitally created electrical messages, the relationship between data and the 'natural' world has been completely broken. Conceivably, complete mind control is possible; this is a true virtual world.

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Biographies

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