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Surveillance, Persuasion, and Panopticon

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Abstract. The surveillance in public and private places, both physically and digitally, is increasing for different reasons. In this paper we intend to discuss surveillance and persuasive technology in an ethical perspective with an eye to its historical and cultural context. In section 1, we present some different tendencies of surveillance in society. In section 2, we elaborate on some important historical ideas on surveillance. In section 3, we consider the use of persuasive technology for surveillance purposes. In section 4, we discuss the development towards increasing surveillance in society, at work, in public places etc. In section 5, we draw up some ethical concerns on surveillance, and finally. In section 6, we discuss the question of a possible need for a public and democratic control of the use of surveillance technology.

Keywords: Captology, persuasive technologies, Panopticon, ethics, surveillance and democratic control.

1 Introduction

There is clearly an increasing interest in various forms of surveillance and information gathering activities. This tendency may be understood in terms of the Greek neologism ‘Panopticon’ (‘pan’ meaning ‘everything’ and ‘opticon’ meaning ‘vision’), which was made famous by the British jurist and philosopher Jeremy Bentham (1748-1832). Panopticon was originally the name for a specific kind of prison (see below), but it has come to signify the wish or the will to let everything be seen and recorded. In modern society this desire seems to be very strong. All sorts of companies, organizations, and institutions want to store data about members, customers, patients etc. Such data are sometimes used for other purposes than those for which they were originally intended. Surveillance systems and IT systems are used to monitor people for different purposes – for instance the purpose of facilitating learning or daily work, or for security reasons.

Surveillance Tendencies

Since the introduction of computerized surveillance – also known as ‘dataveillance’ – in the latter part of the 20th century, we have witnessed an increase in monitoring practices in everyday life. Today, we are being monitored at home, at work and as consumers. Prevalent and emerging technologies such as closed-circuit television,

electronic tagging and handheld computers contribute to the flow of private information in public space. These developments have led to what some people consider an erosion of civil rights and liberties, and a number of studies into this question have appeared. In the wake of the new surveillance technologies and the concern about their implications for the individual and society as a whole, surveillance studies have grown to be a broad field of research. The idea of the Panopticon has provided a metaphorical framework within which to discuss surveillance in a wide variety of contexts.

2 Surveillance in a Historical Perspective

The famous Panopticon building, ‘the all-seeing place’, was designed by Jeremy Bentham towards the end of the eighteenth century. It is a type of prison, also known as the ‘Inspection House’, whose construction enables an observer to watch all the prisoners without their knowledge.

Bentham is also known as a founding father of the ethical theory of utilitarianism, and it is in light of this theory that Panopticon should be understood. The basic principle of utilitarianism, according to which any moral behaviour is evaluated according to its utility, is realized in the prison building, since the design facilitates effective surveillance and control with a minimum of human resources. Moreover, the aim is to punish effectively, but without undue human suffering, the punishment consisting in systematic confinement rather than physical torture. The development from physical torture to systematic confinement is by many considered a humanistic improvement in the history of punishment. This view has later been questioned by Michel Foucault (1926 - 1984), who in his influential book *Surveiller et punir* [7] argued that the change from physical torture to systematic confinement is not necessarily a humanistic improvement, but rather just a different way to exercise power.

For his day, Bentham was a controversial figure, and his prison design stirred attention. Bentham proposed a universal solution to the problems of his day: “Morals reformed - health preserved - industry invigorated instruction diffused - public burthens lightened - Economy seated, as it were, upon a rock - the Gordian knot of the Poor-Laws are not cut, but untied - all by a simple idea in Architecture!” [2 p. 31]

Not only would Panopticon solve the perennial problem of what to do with prisoners, the utilitarian architecture also provided answers to broader political questions. The prisons of this time were brutal, unsanitary, and overcrowded. Hence humanitarian improvements were on the political agenda, and in this context Bentham's prison building apparently offered a more humane alternative. Panopticon made it possible that prisoners could remain on British soil, rather than for instance being deported to Australia, which was not unusual at the time.

However, Bentham was unable to persuade the political establishment that the Panopticon would suffice. The decisive issue leading to the rejection of Bentham's plans was neither the prison design itself, nor its' underlying utilitarian ideas, but the other part of the project, namely the proposal that Panopticon should be open to private contractors. He imagined the prison as a private, profit-seeking enterprise, making money from the labour of the prisoners, and Bentham himself wanted to be

the first contractor. The financial element coursed the project to be turned down, while the commercial gain from running prisons was considered inappropriate. The authority and control of prison labour was best kept in bureaucratic hands, and prisons should not meet economic criteria. Even though Panopticon was rejected by Bentham's fellow countrymen, his idea of such a prison has been very influential. This is among other things due to its effective application to most kinds of institutions where people are to be watched.

The prison was designed to have an inspection tower in the middle surrounded by a circular building with cells. The prison guard should be placed in the tower and the prisoners isolated in the cells, which should all be visible at any time from the tower in the middle. As much as possible of the cells should be made visible, whereas the tower is designed to make the guards inside the tower invisible from the cells, using screens and light as devices to hide the guard from the prisoners. The principle that the prisoners do not know whether they are being watched or not is essential to Panopticon. The prisoners have to presume that they are being watched all the time and must thus behave accordingly. Actually, this renders the guard dispensable, since the prisoners in a way have internalized the inspection by the guard. Thus the prisoner carries out his own surveillance. It should therefore be emphasized that Panopticon is not just the guard watching the prisoners. All personnel and all prisoners as well as the building, that is, the prison as a whole, make up the panoptic structure. An example blueprint can be seen in Figure 1.

Bentham was mainly occupied with prisons, but the utilitarian design could in principle be useful everywhere. Factories, military barracks, schools, and hospitals are institutions where the panoptic design would have obvious advantages. The specific prison design was never realized. Bentham had high hopes, but the utilitarian building was not to make him a wealthy man. Few prisons have been built with a direct influence from the Panopticon, but there are some, for example Eastern State

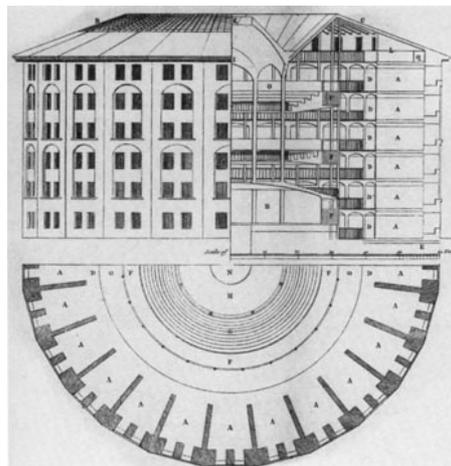


Fig. 1. Panopticon blueprint by Jeremy Bentham, 1791[15]

Penitentiary in Pennsylvania, USA. However, many prisons, factories, military barracks, schools, and hospitals all over the world may have been indirectly influenced by the panoptic principles from Bentham's prison design. As a proposal for a specific architecture the Panopticon is an idea of the past, but Panopticism, i.e. the underlying ideas, constitute a principle still at work today.

Bentham was declaredly a secular thinker. Like many other social thinkers of his time, he was occupied with providing an alternative to the theologically motivated ideas which still dominated society. Religion should be replaced with what he considered to be reason and rationality. Even so, there seem to be some religious undertones in Bentham's assumption that the constant gaze of the inspector will discourage prisoners from doing evil - and perhaps even remove the incentive to think about evil deeds. Since the constant gaze of the inspector can hardly be realized, because continuous supervision would be unpractical and expensive, Bentham comes up with the essential principle that the required supervision only needs to be in the minds of the observed. God's omnipresent eye is thus replaced by the internalization of the observer's potential gaze in the minds of the observed. Bentham rejected Christianity as a solution for social problems. Nevertheless, some of the useful social functions performed by Christianity could in his opinion with advantage be kept - just without its religious core. With the Panopticon, God's eye was thus transformed into a secular context [12 p. 599]. It is, however, clear that this kind of panoptic supervision is in fact qualitatively different from the divine omnipresence included in the Christian idea of an almighty, omnipresent, all-knowing, and all-loving God.

In his *Surveiller et punir* [7], Foucault discussed Bentham's ideas of Panopticon in the context of the European history of criminal law from medieval physical torture to modern day imprisonment. This history is a development leading from public, spectacular, and instantaneous punishment - e.g. the cutting off of limbs - to systematic confinement, putting away criminals into prisons for durations of months or years. Foucault described Panopticism as a new political anatomy, in which discipline replaces the earlier sovereign power (e.g. the king) that was manifested in pomp and circumstance. The sovereign was replaced by a more subtle and hidden authority. This new kind of authority exercised its power by objectifying the subjects which it desired to control, and by creating knowledge about them. Therefore, Panopticism implies a disciplinary power that aims to train and manipulate the body, and Panopticism thus has both a negative and a positive function. The negative function is to set up such limits as are necessary for maintaining discipline, and the positive one is the production which is the outcome of strict discipline. Disciplinary power comprises a series of means including drills, constant reports, testing, regulation, and not least surveillance. Among these means, surveillance plays a prominent part as a kind of 'visibility instrument' that ensures control of the individual. Disciplinary power thus mainly exercises its power through the gaze, more specifically the all-seeing eye.

The Panopticon was also a laboratory or a testing ground for social techniques. It could be used as a 'machine' to carry out experiments with the aim of altering behaviour, or of training or correcting individuals; to experiment with medicines and monitor their effects; to try out different punishments on prisoners, according to their crimes and character, and to seek the most effective ones; to teach different techniques simultaneously to workers in order to decide which is the best; to try out

pedagogical experiments – in particular the well-debated problem of secluded education, by using orphans. [8 p. 3] To sum up the characteristics of Panopticism, at least five points can be made:

1. The observer is not visible from the position of the observed;
2. The observed subject is kept conscious of being visible (which together with the principle immediately above in some cases makes it possible to omit the actual surveillance);
3. Surveillance is made simple and straightforward. This means that most surveillance functions can be automated;
4. Surveillance is depersonalized, because the observer's identity is unimportant. The resulting anonymous character of power actually gives Panopticism a democratic dimension, since anybody can in principle perform the observation required;
5. Panoptic surveillance can be very useful for research on human behaviour, since it due to its practice of observing people allows systematic collection of data on human life.

Bentham's idea of the prison building Panopticon is really just the prototype of Panopticism, where discipline, normalization, and surveillance come together. This observation led Foucault to ask the polemic question, why factories, military barracks, schools, and hospitals have a striking resemblance to each other [7 p. 264]. Foucault's own answer was the contention that Panopticism has become general and is found everywhere. Hence, we live in a prison-like society founded on discipline and surveillance. The formation of this society stems from many historical processes, but it is a surveillance society and its purest form is the prison. Conceived in this way the Panopticon is not only a building. According to Foucault it is rather a schema which can be used for characterizing many aspects of society. In his own words it is "the diagram of a mechanism of power reduced to its ideal form" [8 p. 3]. Although Foucault's Panoptic interpretation of society has been widely criticised, it remains the preferred framework for discussing surveillance and an important inspiration within surveillance studies.

3 The Use of Persuasive Technologies for Surveillance

In his book *Persuasive technology – Using Computers to Change What We Think and Do*, B.J. Fogg gives a definition of surveillance technology, which is adapted to the context of persuasive technology: "... surveillance technology is defined as any computing technology that allows one party to monitor the behaviour of another to modify behaviour in a specific way." [6 p. 46] Fogg's discussion of surveillance presupposes that surveillance must be known by the person observed, who gives the input to the surveillance system in question. Output is sent to the observer, who then interacts with the person observed by either rewarding or punishing [6 p. 57 (Note 30)]. According to Fogg this feedback makes it reasonable to characterize the system as interactive.

Fogg explains the widespread use of surveillance with the observation that it works, that is, that surveillance usually yields the desired results. It has for a long time

been a much researched topic within social psychology, and the conclusion from this research is that observation changes people’s behaviours. Behaviour is changed when the observer is given the ability to reward or punish. This causes the observed subject to try to meet the expectations of the observer [6 p. 46]. Furthermore, the surveillance must be overt, since secret monitoring (covert surveillance) cannot be persuasive technology. However it must be admitted that the way the Panopticon was to be used implies a kind of surveillance which can also be viewed as Persuasive Technology, even though it is not a benign sort. In fact there is an interesting parallel between Foucault’s discussion of the Panopticon and such a use of Persuasive Technology. In Foucault’s terms the designer of (Panopticon-like) persuasive technologies may be viewed as an “inspector” whereas the user can be viewed as a prisoner caught in the framework of the system. Fogg suggests that companies, in order to motivate positively rather than punishing, should call their surveillance systems “incentive systems” or “incentive management technology” [6 p. 48].

In dealing with “Public Compliance without Private Acceptance”, Fogg describes some further results of surveillance. People might accept surveillance while they are being observed and behave according to the relevant prescribed standards. When the monitoring stops, however, they may behave like before, except if they have private reasons for continuing the new behaviour. Fogg mentions ethical concerns in connection with the use of surveillance. He sees ethical questions arising in relation to the preservation of the individual’s privacy and dignity [6 p. 49]. Furthermore, he thinks it makes a decisive difference *how* a system works and whether the intention is “...supportive or helpful rather than punitive” [6 p. 226].

This figure is based on Eric Neuenschwander and Daniel Berdichevsky’s model [3 p. 55]. Eric Neuenschwander and Daniel Berdichevsky’s model differs from

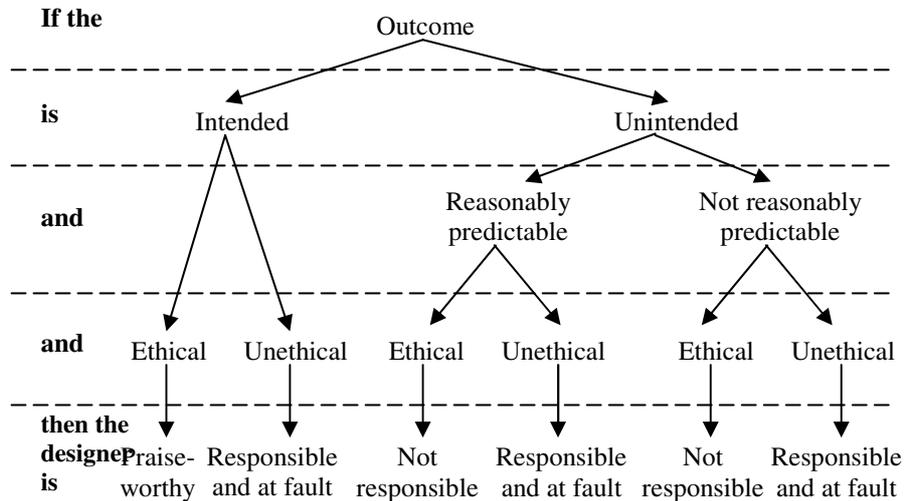


Fig. 2. Fogg’s model of the ethical nature of persuasive technology [6 p. 227]

Fogg's on the case when the outcome is unintended, not reasonably predictable and unethical. In this case Eric Neuenschwander and Daniel Berdichevsky do not see the designer as responsible and at fault. The main criterion of Fogg's proposal for evaluating persuasive technology is indicated by the statement that "the ethical nature of persuasive technology can hinge on whether or not the outcome was intended" [6 p. 227]. Fogg puts forth a hierarchy of questions which in fact make up a decision tree or decision algorithm as depicted above.

Thus, for instance, one must ask as the first question whether the outcome of some use of a piece of persuasive technology was intended or not. Let us try to follow a path through the decision tree. If for instance the outcome was unintended, the next question should be whether it was reasonably predictable or not; if reasonably predictable, then it is time to evaluate whether the outcome was ethical, relative to the values and assumption underlying the particular analysis. If ethical, there is no special ethical value to attach to the designer(s) in question – they cannot be praised, since the positive outcome was not intended, but on the other hand there is no reason for a negative assessment either. If on the other hand the outcome was unethical, the designers are "responsible and at fault", since they ought to have foreseen the unethical effect (being in this case "reasonably predictable"). It should be clear how other paths through the decision tree can be followed [6 p. 227].

Fogg presents his version of a stakeholder analysis as a methodology for analyzing ethics [6 p. 233 f.]. In his analysis Fogg suggests that, like stakeholders, we focus on consequences, both gains and losses. To judge consequences one must also consider who gains the most and who loses the most. Having made our analysis we can then draw ethical conclusions by examining gains and losses in terms of a set of values. In this connection we must acknowledge the values and assumptions we bring into our analysis. This stakeholder analysis does not include the intentions behind the use of a technology, or the methods used to persuade.

Thus Fogg [6] raises various questions – and proposals – concerning the ethical dimension of persuasion and persuasive technology. It is acknowledged that there may be negative consequences of the use of surveillance technology. On the other hand we must keep in mind that surveillance seems to be very effective and useful when it comes to influencing people's behaviour.

It should be added that surveillance is in some cases aimed at behavioural patterns of groups rather than individuals. This kind of surveillance is more complicated, since it involves handling large collections of data in a specific manner. The kind of interactivity involved will also tend to be more complex. If for instance a relevant authority wants to confront a population group with the result of social surveillance (e.g. the drinking habits of young people) in order to obtain a certain change of the group's behaviour, this would presumably call for a sophisticated use of mass media.

4 Modern Surveillance Technology in a Social Perspective

In modern society the possibilities of monitoring people with the purpose of changing behaviour is growing – and hence the temptation to do so is growing, too. Below are

listed a few examples of surveillance systems, all overt in some sense (the intention may be covert, but the surveillance as such is overt).

- Educational systems. Such systems may be designed and implemented with the purpose of educating staff, but may easily develop into a tool for seeing who improves his or her skills, and who does not.
- Accountancy systems. Basically, these are intended to make everybody's job easier. Data are formalized in a way that makes it possible for many systems to read and condition the data. But such systems are also potentially capable of registering if somebody makes a mistake, and to count the number of mistakes.
- Security systems. Such systems are installed in order to protect personnel. For instance, a small card with a chip and a pin-code can be used when entering and leaving all rooms. This also provides the management with the possibility of registering where all employees are at all times.

Such systems are all aimed at the behaviour of identifiable individuals. In other cases, however, the focus of the surveillance is rather on the collective behaviour pattern of specific groups in society. Here the surveillance will often be covert, i.e., not known by the persons being observed. This surveillance of various groups involves using various kinds of search strategies, statistics, and social sorting. In many cases data mining techniques could be utilized. Some algorithms for performing data mining are even classified as privacy preserving data mining (PPDM). They veil data in a given data set, typically extracted from databases, such that privacy is ensured while the veiled or aggregated data can be used as a reliable source for system administration, or indeed research. Even if the focus of surveillance is on social groups and not on individuals, researchers will in many cases be given access to sensitive personal and individual data. And this may of course be seen as a threat to the individual right to privacy. Philosophically, use of PPDM can be seen as a solution to the problem that from a societal point of view the argument "right to know" must be balanced by the individual's "right to private life".

Panoptic Sort and Social Sorting in Research on Personal Data

An increasing number of data describing different aspects of our personal activities are being stored in databases. Our search activities and various kinds of metadata related to what we consider to be our private writings and photos are continuously inspected and gathered for use in databases. In some cases, these databases can be accessed via the Internet. In fact, most of the databases on personal data may in a not too distant future be integrated into one comprehensive system. Information technology may in this way give rise to a new kind of Panopticism. This will obviously be very attractive from a research point of view – and so it may be for private purposes, for that matter. The new Panopticon will be the integrated system of all the personal databases to which the researcher is given access. Given the relevant political permission, the researcher may of course in principle use this new Panopticon as a laboratory – as suggested by Foucault in order to carry out social experiments. However, it is more likely that researchers will generally have to concentrate on observations rather than experiments, the latter being ethically and

politically much more sensitive. But the researcher, like the Panopticon inspector, will be able to ‘spy’ on – or to put it more neutrally, to observe – all the individuals in the system in order to analyze and evaluate their behaviour in various ways.

From the perspective of the welfare of the persons being described, research on personal data may obviously in many cases be beneficial. However, in other cases people may find it problematic that somebody is carrying out research on their personal data and thereby providing results which may turn out to affect their lives. The results of this kind of research will inevitably be used in various kinds of decision making, notably and not least when employing personnel. One important problem has to do with the so-called ‘panoptic sort’, which is a concept Oscar Gandy introduced and described in *The Panoptic Sort: A Political Economy of Personal Information* (1993) [10] as well as in other works:

The panoptic sort is a complex discriminatory technology. It is panoptic in that it considers all information about individual status and behaviour to be potentially useful in the production of intelligence about a person’s economic value. It is discriminatory because it is used to sort people into categories based upon these estimates. [11 p. 133-34]

Usually, information is gathered in order to profile and categorize, and in this way people are included and excluded, qualified and disqualified, in all sorts of contexts. The panoptic sort is thus a pre-emptive means in the hands of governments and commercial enterprises. Gandy’s primary concern back in 1993 seems to have been discriminatory practices related to consumer surveillance, using databases to target ‘valuable’ customers for further advertising, while undesired consumers are dismissed. In the light of the suicide attacks of September 11, 2001, on New York’s Twin Towers and The Pentagon in Washington, D.C., the panoptic sort has become topical in the context of the so-called ‘War on Terror’. All the suicide attackers were Muslims, and this fact could induce a panoptic sort profiling and categorizing of this group of people as potentially dangerous. This could in practice lead to wide discrimination in airports and at border crossings against the millions of people that fit this profile.

This leads to another point relating to the discriminatory technology of the panoptic sort, since profiling and categorizing is not only something that affects people at the individual level. David Lyon has described how surveillance goes beyond the individual realm to the social realm:

[I] argue that there are dangers inherent in surveillance systems whose crucial coding mechanisms involve categories derived from stereotypical or prejudicial sources. Given that surveillance now touches all of us who live in technologically ‘advanced’ societies in the routine activities of everyday life, on the move as well as in fixed locations, the risks presented go well beyond anything that quests for ‘privacy’ or ‘data protection’ can cope with on their own. [13 p. 2]

Thus, discussions of surveillance in the context of research on personal data should not be limited to considerations of privacy – the observation that certain information due to its sensible and private nature should not be accessible without the consent of the relevant person(s). We must also be concerned with the super-individual level and

include questions relating to the social justice of using information for research purposes. Similarly, we should be wary of prejudices which could be inherited in the way information has been gathered.

5 Modern Surveillance Technology in an Ethical Perspective

As mentioned above a distinction should be made between surveillance of the individual and surveillance of groups in society. However, in both cases there are important ethical problems to consider.

Individuals may be watched for security reasons. An example of this kind of surveillance could be digital surveillance, where the system registers the behaviour of the individual. This kind of surveillance is personalized and may imply, or utilize, various accusations concerning the individual (whether proved or not). Just for example, a store owner might video-tape a specific employee whom he suspects of stealing. This problem has prompted the invention of the cash register [14].

Mass surveillance targets groups or certain profiles, which can lead to discrimination of certain groups or people with certain traits. But it may also be justified and in fact necessary to make use of this surveillance technique, for instance to avoid terror activity.

Both kinds of surveillance raise concerns with respect to individual privacy and other civil liberties. On the other hand, surveillance can be seen as a form of persuasive design. If the individual is aware of being monitored he or she will be motivated to change behaviour to what is considered desirable according to society's norms. The same thing applies to group surveillance.

Surveillance of social groups is often carried out using various kinds of data mining, as mentioned earlier. The technique can popularly be defined as "the nontrivial extraction of implicit, previously unknown, and potentially useful information from data" or as "the science of extracting useful information from large data sets or databases" [16]. The purpose of data mining makes it applicable to behaviour patterns of selected social groups, especially when wishing to make general observations without giving researchers access to all individual data. In [4], [5] and [9] data mining and its privacy preserving potentials are discussed.

There is however one further question that applies to the ethics of persuasion and surveillance of individuals as well as groups. As argued by B.T.C. Atkinson [1] the intent of 'the persuader' should be made clear to whoever is exposed to the use of persuasive technology. If this condition is not fulfilled, the process should be characterized as manipulation. The view is that openness regarding the purpose of the technology employed could serve as a kind of 'ethical safeguard'. In relation to the use of surveillance technology for persuasion purposes this means that the people under observation, should be made aware of the intent of those conducting the surveillance. However, in many cases the purpose of surveillance is rather vague and general. When it comes to group surveillance, mass media will usually be involved when the result is communicated. We agree with this basic principle, but it must be admitted that it is difficult to make a clear distinction between the use of mass communication for persuasive purposes as opposed to the purpose of informing.

6 Conclusions and Further Perspectives

Surveillance makes it possible to change the behaviour of individuals – at least as long as they know they are being monitored. Surveillance may also influence the behaviour patterns of social groups, especially if the results of the surveillance studies are communicated in an adequate manner using mass media.

If one wants to limit surveillance involving private and ethically sensitive data, it may be required that access to the data is limited. All data may be depersonalized before they are used for research purposes. But such requirements may also make many important research projects very difficult or outright impossible to carry out. For this reason, it may be relevant to look for ethically acceptable alternatives to depersonalization and other requirements limiting research access to all relevant data. One obvious solution is to make use of privacy preserving data mining algorithms which make it possible to run the surveillance systems without human inspection of sensitive data. The appealing aspect of this approach is the fact that data need not be traced back to any individual. On the other hand, this makes an assessment of the correct use of the data with reference to ethical norms more important.

There is no reason to underplay the importance of developing good data mining algorithms, as long as this kind of computer based privacy preserving tools is not presented as the solution to all ethical problems of panoptic research and surveillance. The development of data mining algorithms is important as a possible way to ensure a high ethical standard in panoptic research and surveillance of personal data. But it is also clear that the use of such algorithms is not sufficient for that purpose. We also need some sort of public and democratic awareness and discussion of the values on which the data mining algorithms are based. Here the only acceptable solution seems to be some sort of control on the collection as well as the use of data in panoptic research and surveillance. This control should also include other aspects and problems such as social sorting by means of which can be disadvantageous for certain people in an unjust manner. Another potential problem, which calls for democratic awareness is data dredging, i.e., “...the inappropriate (sometimes deliberately so) search for ‘statistically significant’ relationships in large quantities of data” [17].

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References

1. Atkinson, B.: Captology: A Critical Review, in IJsselsteijn, W. In: IJsselsteijn, W., de Kort, Y., Midden, C., Eggen, B., van den Hoven, E. (eds.) PERSUASIVE 2006. LNCS, vol. 3962, pp. 171–182. Springer, Heidelberg (2006)
2. Bentham, J., Bozovic, M.: The Panopticon writings, London, New York, Verso (1995)

3. Berdichevsky, D., Neuenschwander, E.: Toward an ethics of persuasive technology. *Communication of the ACM* (1999)
4. Bertino, E., Nai Fovino, I., Parasiliti Provenza, L.: A Framework for Evaluating Privacy Preserving Data Mining Algorithms. *Data Mining and Knowledge Discovery* 11, 121–154 (2005)
5. Domingo-Ferrer, J., Torra, V.: Privacy in Data Mining. *Data Mining and Knowledge Discovery* 11, 117–119 (2005)
6. Fogg, B.J.: *Persuasive technology – Using computers to change what we think and do*. Morgan Kaufmann, San Francisco (2003)
7. Foucault, M.: *Surveiller et punir: naissance de la prison*, Paris, Gallimard (1975)
8. Foucault, M.: *Discipline & Punish*. Translated from the French by Alan Sheridan, 195–228 (1977), <http://foucault.info/documents/disciplineAndPunish/foucault.disciplineAndPunish.panOpticism.html>
9. Fule, P., Roddick, J.: Detecting Privacy and Ethical Sensitivity in Data Mining Results. In: Estivill-Castro, V. (ed.) *Conferences in Research and Practice in Information Technology*, Australian Computer Society, Inc. (2004)
10. Gandy, O.: *The Panoptic Sort: A Political Economy of Personal Information*. Westview Press (1993)
11. Gandy, O.: Coming to Terms with the Panoptic Sort. In: Lyon, D., Zureik, E. (eds.) *Computers, Surveillance, and Privacy*, Minneapolis University Press (1996)
12. Lyon, D.: Bentham’s Panopticon: From Moral Architecture to Electronic Surveillance. *Queen’s Quarterly* 98, 596–617 (1991)
13. Lyon, D.: *Surveillance as Social Sorting: Privacy, Risk, and Digital Discrimination*, Routledge (2003)
14. Quorion Data Systems (accessed March 28, 2007), www.quorion.de/Cash%20Registers/cash_register_history_types.htm
15. Wikipedia 2006a. Image: Panopticon (accessed March 9, 2006), available at the website <http://en.wikipedia.org/wiki/Image:Panopticon.jpg>
16. Wikipedia: 2006b. Data mining (accessed February 27, 2006), available at the website http://en.wikipedia.org/wiki/Data_mining
17. Wikipedia: 2007c. Data dredging (accessed January 30, 2007), available at the website http://en.wikipedia.org/wiki/Data_dredging