

The Great Catopticon

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Abstract

Since a couple of years ago, some well known computer scientists, such as Steve Mann, argued that the development of information technologies and their capturing of everyday life with webcams and RFID (Radio-Frequency Identification) would not lead to surveillance, but to what they called *sousveillance*, i.e. to a state where everybody would be watching everybody. For them, the diffusion, on the web, of all available information, would prohibit the existence of a central superpower that has the exclusive privilege to watch without being watched. This paper is aiming to demonstrate that the underlying structure of *sousveillance* is a Catopticon, i.e. a mirror tower based architecture. The notion of Catopticon has been defined in opposition to the Bentham's Panopticon, which rationally organizes surveillance. The paper draws some possible ethical consequences of the extension of the Catopticon to the entire planet. It tries to show that a universal Catopticon is necessarily unique in nature and that it can coexist with multiple Panopticons. As a consequence, a generalization of *sousveillance* principles does not prohibit the existence of surveillance societies.

Keywords: Panopticon, Catopticon, *sousveillance*, surveillance, transparency, privacy, EyeTap, JenniCam

INTRODUCTION

With search engines, webcams, RFID (Radio-Frequency Identification), mobile technologies, cloud computing and chips embedded cards, all we do, i.e. all our movements, talks, expenses etc., may be continuously recorded, stored and exchanged. Many of us fear such archiving of our private life. The general argument is easily understandable: a Big Brother could use these continuous records of all our personal activities against us and consequently, it would restrict our freedom and our secrecy. However, some scientists don't share this view. For instance, Steve Mann¹ argues that the diffusion of all private information will contribute to establish a new social equilibrium called *equiveillance*, where everyone is watching everyone. These scientists distinguish the classical surveillance, where a few are watching the majority without being viewed, from the regime of *sousveillance*, in which everyone has an equal access to all information about the others.

This view seems to be reinforced by the current development of social networks, like Facebook, where members give freely private information available to everybody. Nowadays, many of our contemporaneous, especially youth and teenagers, don't fear surveillance. They like authenticity. They don't want to hide themselves. They agree providing access to their intimacy and to everything about themselves; in return they demand a total transparency. The success of the Jennifer Ringley's website attests this tendency. This young girl had installed webcams in her student bedroom and then, during seven years, from April 1996 until the end of 2003, she has continuously diffused views of her intimacy on the web. She quickly became very popular. There were more than five millions visits per day on her website, which has been seen as a social

¹ Steve Mann got a PhD from the MIT; he is now professor at Toronto University, where he is working on human computer interaction.

phenomenon. Jennifer Ringley² herself has been considered not only as a young exhibitionist but also as a conceptual artist who could anticipate the future state of a society.

The goal here is not to analyze the social web or the Jennifer Ringley success from a social, a psychological or a mathematical point of view, but to understand the philosophical meaning of such evolutions. The aspiration towards transparency corresponds to some sort of utopia, i.e. a kind of ideal view of the society where nothing would be hidden. This utopia is not new; for instance, in the 19th century, Nikolai Chernyshevsky had formulated it in a famous novel entitled “What is to be done?” that subsequently greatly influenced Lenin and many other Russian revolutionaries. Later, in the beginning of the 20th century, many people, such as André Breton in his novel “Nadja”, Paul Valéry in “Monsieur Teste” or Walter Benjamin in “Experience and Poverty”, have also expressed a desire for total transparency. At that time, the extensive use of glass architectures, for instance the “Crystal Palace”, designed by Joseph Paxton and built for London Great Exhibition of 1851, seemed to render this total transparency reachable. However, even in glass buildings, the transparency remained restricted to a local area. Nowadays, things appear different. Modern techniques, which are the information and communication technologies, render the achievement of a total transparency feasible at the earth scale. This might greatly affect the structure of the society, as the separation between the private and the public spheres, that organized the society for the last three centuries, since the institution of a legal state, has now become blurred.

By introducing the notion of Catopticon, derived from the Bentham’s Panopticon, this paper attempts to investigate the logic of the generalized sousveillance that underlies, according to Steve Mann, all these contemporaneous phenomena. The paper is divided into five parts. The first one is dedicated to the introduction of the concepts of sousveillance and equeveillance. The second part describes the architecture of both the Bentham’s Panopticon and the Catopticon. The third part shows how these architectures spread to the entire planet by the generalized use of informational technologies. The fourth part shows the properties and the limitations of these extensions. The fifth and last part concludes on the ethical and political perspectives of which the great Catopticon clarifies the issues.

SURVEILLANCE, SOUSVEILLANCE & EQUIVEILLANCE

Surveillance

According to Steve Mann, the surveillance characterizes situations where a watcher is positioned above the watched, “above” being understood from both a positional and a social point of view. It follows an asymmetry between the watcher, who may use any information he has about the people he observes, and the observed individuals, who have no information about who watches them. Consequently, the watchers dominate the watched, who are under their total control. The aim of the police in totalitarian state is undoubtedly to establish such a regime of surveillance. The 20th century offered many cases of generalized surveillance in totalitarian societies like the Italian fascism, the German Nazism or the soviet Stalinism. Many authors, such as Franz Kafka and George Orwell, exacerbated the logic of the surveillance society. For instance, “1984”, the famous George Orwell’s novel, depicts the paroxysm of the surveillance society where one individual is continuously watching everybody and everything. Note that the logic of surveillance is not restricted to the gaze, i.e. to the information access. Information dissemination is also one of the characteristics of the surveillance societies in which the diffusion follows the line of sight and where the broadcasting is totally controlled by a central organization that imposes its absolute censure.

Sousveillance

By opposition to the surveillance, the sousveillance characterizes situations where the watchers are placed under the watched. The term sousveillance is a neologism derived from the French word surveillance, which is composed of “sur”, above in French, and “veiller”, to watch. By analogy, sousveillance is built with the prefix “sous” that means under. Examples of sousveillance are numerous,

² The interested reader may refer to the Wikipedia article about Jennifer Ringley - http://en.wikipedia.org/wiki/Jennifer_Ringley

for instance, citizens who film the police, or civilians who photograph government officials are typical cases of sousveillance. In the present days, the information technologies make everybody a potential broadcaster: it's enough to have a mobile phone or a webcam, to record pictures and sounds and to put them on a personal weblog or anywhere on the web. Many cheap devices exist that can easily be managed for that purpose. For instance, Jennifer Ringley developed a special webcam, the so-called "JennyCAM" (Jimroglou 1999), giving her the opportunity to continuously broadcast videos on a personal weblog; Steve Mann designed a new device called the "EyeTap"³ worn in front of an eye and acting both as a camera, which captures the continuous visual flows, and as a screen that displays computer-generated imagery, the latter coming from other "EyeTaps" or from any visual recorder. As a consequence, it is now possible for everyone to broadcast the information he wants, when he wants, without fearing any censorship.

In the sousveillance regime, the observer, who is situated under the watched, can't control him. According to Steve Mann, a new social and political order derives from this physical disposition. More precisely, he argues that, when the sousveillance is generalized, everybody is watched by everybody, which makes impossible for a few to govern or impose their views. Let's suppose that an incident happens in the street: patrolmen are beating youths. Anyone may record this scene with its mobile phone and diffuse the pictures online earlier than any journalist could, and before the police authority has heard about it. This easy information broadcast is not restricted to surveillance; more generally, it may help people exchanging information about any concern in the everyday life. For instance, in Paris subway, travelers of the line 13, very often delayed, have decided to exchange information with their mobile phones using the Twitter messaging facilities. However, people do not always communicate freely through technologies for the best: everybody remembers when, the end of 2008, during the Mumbai attacks⁴, terrorists used Twitter, Flickr and other social web technologies, by amplifying the scope of their action through the international medias, and, in a more active manner, by exchanging and obtaining strategic information about the current situation. Whatever our appreciation may be, positive or negative, of the role of communication technologies, from their general use may result a new social organization, where the officials in charge of the administration, the police or other intermediary bodies can be short-circuited more and more easily.

Equivveillance

Note that the logic of sousveillance is not restricted to information access and to information diffusion. It also concerns all aspects of the society where the traditional roles are transformed. The authority, i.e. the legal power, is submitted to the domination of the watchers who continuously observe and comment each of their acts. Politics, diplomats, police, physicians and all those traditionally licensed to act confidentially, now need to modify their practice and to act in open air. As a consequence, the role of administration is changing rapidly. Its place becomes less and less central. It does not mean that it disappears, but it is evolving. The bureaucracy understood, by reference to Max Weber (Weber 1969), as the ideal-type of a rational and legal form of domination, is vanishing and is giving way to a new form of administration, which does not act as dominant, but as a partner or a facilitator. Nobody will really complain about the loss of the bureaucracy; however the resulting social organization may generate new offensive forms of domination, without any of the intermediaries to smooth the antagonisms.

According to Steve Mann (Kerr & Mann 2006), there is no such a risk: the generalized sousveillance spontaneously conducts to a regime of equilibrium that he calls *equivveillance*. In such a regime, we are all under the permanent observation of all. Everybody is acting under the control of everybody. Therefore, everyone is obliged by everyone. Steve Mann claims that it forces each person to adopt an ethical behavior. In a way, this permanent control of the controller (i.e. of those who have the authority) may result in a new form of transparency. Steve Mann asserts also that the continuous record and retrieval of everyone's personal experiences lead to a state of equivveillance, since everybody will be able to get access to all personal archives and consequently to judge

³ Interested readers may read the "EyeTap" home page (<http://wearables.blu.org/>) or the wikipedia article dedicated to the "EyeTap" (<http://en.wikipedia.org/wiki/EyeTap>)

⁴ Among the many papers published on this topic, the interested reader may refer to the Telegraph (<http://www.telegraph.co.uk/news/worldnews/asia/india/3530640/Mumbai-attacks-Twitter-and-Flickr-used-to-break-news-Bombay-India.html>)

everyone's acts with respect to the precise informational context of his or her behavior. It follows, that the development of wearable computer that supplies people with continuous images and sounds capture devices would facilitate the emergence of sousveillance.

Steve Mann argues that those techniques contribute to both the empowerment of the individuals and the enforcement of the democracy. According to him, the elites will no more abuse of their power because they will be continuously cleared. Without weakening Steve Mann's originality, note that this idea is not new. During the French revolution, some people promoted the institution of the so-called "iron mouths", iron mailboxes where everybody was free to send public opinion on any subject, which was then printed and spread using the new postal techniques. Inspired by Jean-Jacques Rousseau, the advocates of "iron mouths" argued that it supported what they called the fourth power, i.e. the power of the opinion, against the power of the representatives, suspected to act in their personal interest.

Nevertheless, sousveillance may have some opposite effects. For instance, the institution of "iron mouths" also made possible an easy slander and calumny of personal enemies. More generally, the sousveillance changes the "syntax" of the society, which may introduce confusions. As a consequence, power has more and more difficulties in imposing its will, which may lead to a state of anarchy (by reference to the etymology of the word "anarchy", which comes from the Greek word *anarkhia* – an- "without" + -*arkhia* "power"), or an absence of leadership. Let us illustrate this with one example of the possible confusion that can result from the generalized sousveillance. It comes from one recent episode of the French political life. In November 2006, a few months before the March 2007 French presidential election, M Alain Duhamel, a politic commentator, was invited to participate to an academic debate in the Paris school of political sciences. During his intervention, he criticized the campaign of one presidential candidate, M François Bayrou⁵. But, to weaken his critics against the politician, he said incidentally that he would vote for him. It happened that someone made a non-authorized video record of M Duhamel's intervention⁶ and diffused it on the web some months later, in February 2007. Having being accused to publicly support M François Bayrou, Alain Duhamel was condemned to stop his activities of political commentator in the media during the presidential election campaign. This example shows how the so-called sousveillance leads to the confusion between an academic freedom of speech and an official declaration in the public sphere. This could have tragic consequences for us, as academics, if our debates and discussions would be permanently diffused to everybody in the world. More generally, the confusion between the different spheres of reality could really be a nightmare. The nature and the necessity of these differences need to be understood, but, before, we have to understand the structure of this new world. Our aim, in this paper, is to investigate it. As we shall see in the next section, we propose to use and to tweak the architecture of the Bentham's Panopticon, originally designed for surveillance, for this purpose.

PANOPTICON AND CATOPTICON

The architecture of Panopticon

The architecture of Panopticon has been designed, at the end of the 18th century⁷, by Jeremy Bentham (Bentham 1838) to facilitate the surveillance of prisoners in jails. According to Michel Foucault (Foucault 1975), Panopticon defines a structural schema, which played a key role in modern societies since the establishment of a rational legal fundament of the social order. Its role is to teach, to redress and to amend. Even if there were, during the 20th century, some attempts to generalize Panopticon to the overall social order, for instance in Soviet Union, most modern societies are only in part organized on Panopticon schema. Some key institutions like prisons, schools, hospitals, and asylums are organized on this model. However, Panopticon influences the

⁵ François Bayrou was one of the candidates to the French presidential election in 2007. He got 18,57% of the votes in the first round, and was positioned just after Nicolas Sarkozy (31,18%) and Ségolène Royal (25,87%).

⁶ http://www.dailymotion.com/video/x151aw_duhamelvotebayrou

⁷ The first papers on the Panopticon have been published from 1780.

overall structure of the society, as it threatens all the deviants, i.e. criminals that are put in jail, sick persons in hospitals, crazy people closed in asylums, etc.

Briefly,, the Panopticon is built as a ring around a central tower (cf. Figure 1), where observers can see all prisoners' actions. The cells are transparent: they receive and transmit the sunlight in such a way that the inspector may observe every movement of a prisoner without being viewed. In addition, prisoners are totally isolated from each others. To summarize, the three main Panopticon principles are:

1. the total transparency of cells,
2. the fundamental dissymmetry, which makes the observer watch all the prisoners, without being watched, and
3. the isolation of the prisoners who can't communicate each others.

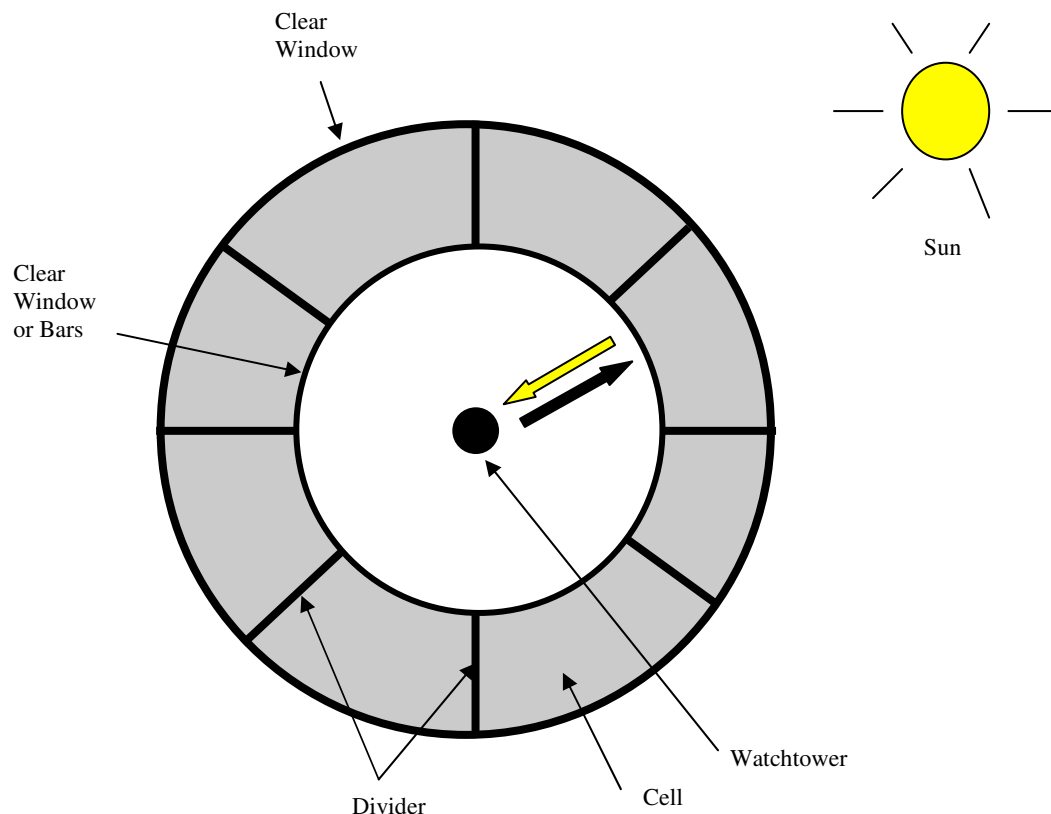


Figure 1: the schematic principle of Panopticon

As a consequence of such a structure, the Panopticon society is basically hierarchic one. The status of those who are located in the watchtower differs strongly from the status of cell occupants. The first ones watch without any risk; the second ones are continuously submitted to the watch of the controllers, without having any information about who is controlling them. Originally, Panopticon has been designed by Bentham just as architecture for prisons, the goal being to rationalize the surveillance in a utilitarian perspective. Its initial role was to redress, to cure and to teach the law; it has then been extended to other social institutions that have been progressively seen as "curative". For instance, schools, hospitals, army, factories etc. have been organized in conformity with this model. Even if Panopticon was not designed as a model for the overall society, it influenced its constitution and most of the social bodies were structured on the model of Panopticon. More precisely, as Foucault says, Panopticon corresponded to a new state of the society where an impersonal law replaces the person of the Sovereign. Panopticon is a symbol of the logic of the surveillance society where few privileged people, i.e. the administration or the occupant of the watchtower, take advantage of their position. It explains the hierarchy of the society, which is

no more family or heredity based. More generally, the differences in social status depend on the places that men occupy in different Panopticons that constitute the society.

Catopticon

By analogy and by contrast to the three surveillance principles on which Panopticon is based, there are three fundamental principles of sousveillance that are:

1. the total transparency of society,
2. the fundamental symmetry, which gives everybody the ability to watch – and consequently to control – everybody, and
3. the total communication, which makes everyone able to exchange to everyone.

In practice, it means that there is no hierarchy, since there is no central tower, and that everyone may communicate to everyone in a total transparency. This structure differs radically from the Panopticon schema. The design of an edifice that renders possible such a total communication among its inhabitants is here derived from Panopticon schema.

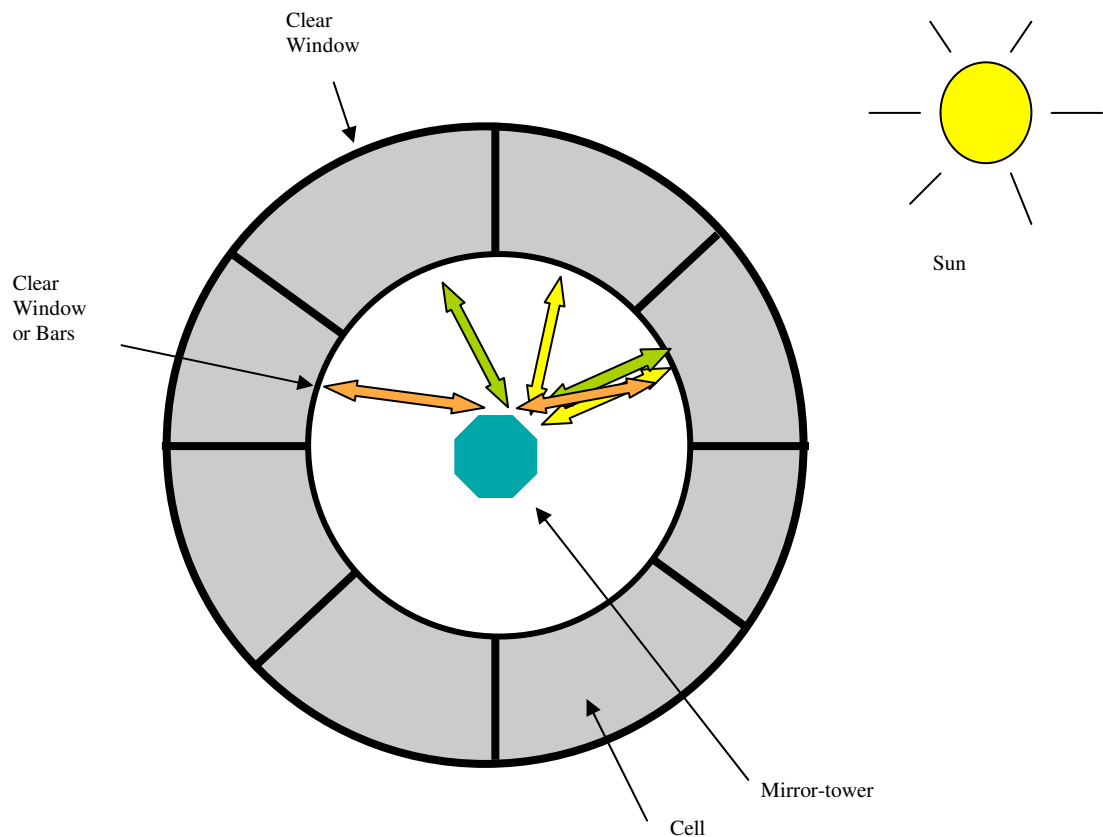


Figure 2: the schematic principle of Catopticon

This architecture of sousveillance, which obeys to the three above mentioned principles, replaces the Panopticon watchtower by an empty mirror-tower that renders everyone able to communicate with everyone (cf. Figure 2). It is based on the notion of “reflectionism”; a word invented by Steve Mann to describe the procedures using technology as mirrors against bureaucratic organizations. Since this architecture is a derivation of Panopticon based on mirrors, we decided to call it Catopticon (from the catoptrics, the study of light reflection and mirrors).

The two main properties of Catopticon are, first, that it does not generate inequalities, since it does not introduce any difference of status between the occupants, and secondly, that the space is totally transparent.

EXTENSIONS OF CATOPTICON

Panopticon was designed to be a building. Consequently, it is geographically located and limited to at most, a few hundreds of meters length. The Catopticon architecture that is derived from the Panopticon architecture supposes, implicitly, that it is also restricted to a building. As a consequence, its size is also limited. With the information and communication technologies, the structure of both Panopticon and the Catopticon may be expanded in huge proportions. Our aim, in this section, is to examine such extensions.

Geographical Extension

Modern information technologies, e.g. webcams or wearable computing, render now possible the extension of Catopticon to the global human society throughout the entire planet. More precisely, new devices, for instance the Jennifer Ringley's JenniCam (Bailey and Kerr 2007) or the Steve Mann's EyeTap, are designed to record continuously personal information and to retrieve it anytime, anywhere, throughout the globe. As a consequence, it is possible for anyone to get information about anyone, which corresponds exactly to the principle of *sousveillance* on which is based Catopticon.

Let us remark that, simultaneously to this extension of Catopticon to the global society throughout the entire planet, Panopticon itself may be considerably extended. Nevertheless, we can also prove that, by nature, Panopticon cannot be extended to the entire society, since it has been designed to correct and to reform people and it is – at least in principle – transitory.

Extension to the Virtual World

In parallel to its physical extension to the entire planet, Catopticon has also been enlarged to the infosphere: not only human, but other informational organisms – the so-called *inforgs* (Floridi 2008) – belong to Catopticon. More generally, a modern Catopticon is part of a virtual world built on the infosphere. Equipped with artificial intelligence techniques, inforgs may freely communicate among each others; some of them are humans while others may be artificial intelligent agents, virtual robots or chatterbots. All human beings, artificial intelligent agents and other inforgs, belong to Catopticon. Nevertheless, even if Catopticon can be extended to the infosphere, it is not sure that it contains all the infosphere. This point needs a further discussion, which goes beyond the scope of this paper.

Note that Panopticon may also be extended to the overall infosphere with the use of new information technologies. But, the meaning of both extensions, the extension of Panopticon and the extension of Catopticon, differ. Since the inhabitants of the Panopticon periphery, i.e. the cells, cannot communicate to each others, no matter the presence of artificial agents there. In contrast, artificial agents that would have been admitted in the watchtower could act as efficient controllers. These agents could continuously check that the activities of the inhabitants of the periphery are conforming to the rules. Consequently, it would considerably decrease the amount of work of the official warder. In the future, one could even imagine that for the sake of equality nobody would allow anyone, except artificial agents, to act as controllers.

THE LOGIC OF UNIVERSAL CATOPTICON

The extension of Catopticon to the entire planet, to all the humanity and then to the overall infosphere defines what we call *universal Catopticon*. Our postulate is that the concept of universal Catopticon can help elaborating an ethics of information on a solid foundation and argue against both rapid technophilia and old technophobia. In this section, we show the uniqueness of the universal Catopticon and the possible coexistence of the universal Catopticon with multiple local Panopticons. Before providing a sketch of such demonstrations, let us indicate the logical framework that we deploy to formalize Catopticon and Panopticon. We first consider that both Catopticons and Panopticons are composed of locations, the L_i , and are inhabited by inforgs, I_j , which may be either humans or intelligent agents. Usually, each inforg I_j live in one or more

locations L_i , which is characterized by the binary predicate $location(I_i, L_i)$. Each inforg can develop the locations he is living by placing there any content C_p he/she/it accesses and likes, which means that $\forall I_i \forall L_j \forall C_p location(I_i, L_j) \wedge access(I_i, C_p) \wedge like(I_i, C_p) \rightarrow contain(L_j, C_p)$.

Proof of the uniqueness of the Universal Catopticon

In Catopticon, everybody gets access to everything that is contained in the locations he/she knows, which means that: $\forall I_i \forall L_j \forall C_p knows(I_i, L_j) \wedge contains(L_j, C_p) \rightarrow access(I_i, C_p)$. Let us now suppose that there exists two extended Catopticons that we call A and B for convenience. Either A and B are connected or not. If they were not connected, it would mean that there would not exist anyone belonging to A who had access to B and vice-versa, which is contradictory with the planetary extension of the universal Catopticons. If A and B were connected, then there would exist at least a location L_j that belongs simultaneously to A and B. Since they belong to A, all inforgs of A inhabiting L_j may add new contents to it. As a consequence, L_j may contain all the contents accessible to inforgs of A. As they simultaneously belong to B, all inforgs of B knowing it have potentially access to its contents, i.e. to the contents accessible to the inforgs of A. In conclusion, all inforgs of B have potentially access to all the contents accessible to inforgs of A and, by symmetry all inforgs of B have access to the contents accessible to inforgs of A. As a consequence, the extended Catopticons A and B cannot be distinguished any more, because they have naturally merged.

Since everything is accessible to everybody, communications are mainly public and transparent through exhibitions in the different locations L_j of the extended Catopticon. However, we don't live only in a public space: we exchange many private emails each others daily. Therefore, we have to take into account those private exchanges in our model. It can be done by adding a predicate $send_message(I_i, I_k, C_p)$ that characterize the private exchange of information between inforg I_i and I_k . This addition does not affect our demonstration by any means. As a matter of fact, if two extended Catopticons A and B, coexist simultaneously, they necessarily merged.

Proof of the Multiplicity of Extended Panopticons

As previously stated, in Catopticon, individuals may have access to every place they know. In Panopticon, things happen in a different manner since everybody is assigned to a fix location that belongs either to the periphery or to the watchtower. The watchtower inhabitants may freely communicate with every inhabitant of the periphery, but the inhabitant of the periphery can only communicate with watchtower inhabitants. As a consequence, the way the people communicate depends on their location. Watchtower inhabitants have access to all the contents accessible to the inhabitants of the periphery, i.e. $\forall I_i \forall L_j \forall C_p \forall W_k \forall I_m location(I_i, L_j) \wedge access(I_i, C_p) \wedge watch_tower(L_j, W_k) \wedge location(I_m, W_k) \rightarrow access(I_m, C_p)$. In contrast, for the inhabitant of the periphery, the access to the center is submitted to a preliminary authorization of the inhabitants of the watchtower: $\forall I_i \forall L_j \forall C_p \forall W_k \forall I_m location(I_i, L_j) \wedge watch_tower(L_j, W_k) \wedge location(I_m, W_k) \wedge access(I_m, C_p) \wedge authorization(I_m, I_i, C_p) \rightarrow access(I_i, C_p)$. As a consequence of this requirement, the union of two Panopticons A and B is submitted to the authorization of the inhabitants of both the watchtowers of A and B. Therefore, many Panopticons may subsist separately when the inhabitants of their respective watchtowers don't agree to merge.

Coexistence of the Universal Catopticon to Multiple of Extended Panopticons

The last point refers to the coexistence of the Universal Catopticon with multiple Panopticons. As a matter of fact, nothing prohibits the simultaneous existence of the Universal Catopticon with multiple extended Panopticons. Without going into details, some dictators, like Kim Jong-il in North Korea, succeed in isolating some areas from the rest of the world, which in this case physically prohibits any access to the network and consequently any participation to the great Catopticon. It may also happen that some states control and restrict the access to the network, as it is now the case in China. But, in parallel to those geographically circumscribed Panopticons, there exist some virtual Panopticons that exercise their influence on their members. Multinational companies or religious sects are examples of such networks that compel their members to secrecy and to a total obedience.

In conclusion to this section, note that, contrary to Steve Mann (Mann et al. 2003) who pretends that sousveillance allows to "surveil the surveillers", we claim that the emergence of some new

hierarchies that may impose a local totalitarian power should always be feared. This power is not necessarily geographically localized, as it was in the past; now, multinational companies or mafia can perfectly do it with a delocalized global world. Simultaneously, Catopticon opens some new perspectives from a political and social point of view that have to be explored.

The limitations of the universal catopticon

The extended Catopticon, where everyone exchanges to everyone, fits in to an ideal figure, which can't be fully achieved. There are several practical limitations that restrict the communications among the humankind. For instance, human cognitive abilities are imperfect and limited, and it is not possible for an individual to permanently access to the personal archives of the 6 billions humans. As a consequence, each of us restricts his or her attention to few person. Therefore, those who have the ability to capture the attention – and to become idols – get an incredible advantage. The opposite is also happening: while, in the modern bureaucratic time that was, according to Michel Foucault, characterized by the schema of Panopticon, the watchers got the power, now, in the information society, the lead comes to those who are watched.

As an illustration of these new relations of domination, let us consider the logic of the net economy: it is based any more on the utility of the provided goods, as was the old economy, but on publicity. In other words, no matter the goods and their utility; goods are not more than a pretext to make a site popular, because profitability is mainly based on popularity. To measure the efficiency of advertisements it is usual to evaluate the audience of the website where it is published. Therefore, the more a site is visited, the more advertisements that are published there are of value and the more the site yields profits. As a consequence, today, one of the most valuable activities is not to produce goods, but to artificially increase the search engine site index, i.e. to generate what is called "spamdexing". Many techniques exist for this, for instance the creation of link farms that are clusters of highly interconnected websites. The site index being computed with respects to the number of references, it is increased by the number of hyperlinks that point to him. As a consequence, those who want to artificially increase their site indexes, pay for being mentioned in some link farms.

In addition, intelligent agents, avatars and other virtual beings are also members of the infosphere; consequently, we may also exchange with them, which adds again some supplementary confusion. Not only those inforgs increase the number of potential information sources, but also they are built to make illusion. It even appears that, for multiple reasons among which some are ethical, they may have either to hide information or to lie. Therefore, the total transparency, which appears to be a pre-requirement to Catopticon, cannot be totally achieved.

CONCLUSION AND PERSPECTIVES

As it was previously shown, the notion of universal Catopticon helps to discuss the fundamentals and the limits of privacy, which are undoubtedly deeply modified by the generalized use of information and communication technologies. It can also be used to understand some aspects of the modern political order, where politicians have less and less ability to decide by themselves and where people is submitted to new digital servitudes. Note that the principles on which Catopticon is based – i.e. the strict equality, the absence of hierarchies, the end of sovereignty, the perfect communication and the total transparency – seem to be currently accepted by almost everybody in the modern developed countries. Even if it does not totally correspond to the exact state of the present information society, it defines an ideal schematic structure that shapes the contemporaneous social and political order in the exact same way as Panopticon was a schematic model on which many aspects of the social institutions of the modern age, e.g. prison, asylum, hospital, school, etc., were shaped. Our goal, in this paper and in the future, is to explore our contemporary social order through the structure of the universal Catopticon.

The existence of the universal Catopticon raises many questions. Among them, one is relative to the separation between the public and the private sphere, on which the modern societies were based since the imposition of a legal state. Note that, before this separation, the person of the Sovereign had a total access to everything that concerned his subjects, including their family life, their thoughts and their beliefs. With the end of absolute monarchy, the legal state introduced

separations between the private and the public sphere. Today, many people, especially young generations, would like to see the private spheres invade all the public space. The popularity of social networks is one of the symptoms of this evolution. The notion of sousveillance, theorized by Steve Mann is another sign of that transformation. It seems that this means the end of privacy, i.e. the end of the separation between the individuals and the society. The Catopticon that was presented along this paper tends to enlighten and to formalize those evolutions. Therefore the open question is: does the advent of the universal Catopticon means the end of the legal state and the beginning of a new political order?

As a conclusion, let us express our last point by reference to the famous George Orwell's novel: "Is "1984" behind or before us?"... Arithmetically 1984 seems to be behind. People like Steve Mann tell us that the sousveillance technologies offer guarantees against the surveillance society. To this respect, it is also definitively behind. But, from a strict logical point of view, the study of Catopticon shows that nothing prohibits the coexistence of Catopticon with multiple Panopticons and the future subsistence of Panopticons in the 21st century.

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