

Participatory Surveillance in the Intelligent Building

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Introduction

The rationale behind the so-called intelligent building¹ is a vision of more flexible interaction with computers. It makes computers less visible, if not invisible, as they become part of the surroundings rather than being objects that need direct instructions through a formal interface. The intelligent building is conceived as a caring environment where computers adapt to human existence, rather than the other way around. However, this sympathetic idea raises privacy questions. For the intelligent building to be an adaptive, caring environment, it needs to generate and store quite a lot of information about the behaviors and lifestyles of the inhabitants. Basically, the perfect intelligent building needs to monitor everything that goes on within the walls of the house. The information generated, which when isolated may seem unimportant, flows together to form meaningful information images of the inhabitants. Furthermore, it seems likely and desirable that the intelligent building should be connected to the outside world via the Internet, in the same way that most digital devices are connected today. In this way, computation—which itself is almost invisible—has the potential to make home and work life visible to the world.

As indicated, the discourse surrounding the intelligent building seems to have two contrasting visions that accompany this scenario: The dream of efficiency and care and an opposing nightmare vision of compromised privacy and control. These opposing visions are mirrored in surveillance studies, where care opposite control is recognized as the “Janus face” of surveillance²—although a more complex characterization can be deduced from the wide variety of domains studied, ranging from social control³ to empowerment and resistance,⁴ art and entertainment,⁵ and social practices.⁶ These opposing visions and discourses not only are relevant in relation to intelligent buildings, but are equally important when designing technology for various contexts and purposes where the same tensions surface (e.g., personalized search engines, GPS and camera surveillance in taxis, or adaptive learning environments) and thus have wider currency in design studies.

In the following we argue that the two visions of the intelligent house share a focus on the built structure itself and, paradoxically, on the external stakeholders (e.g., caregivers, potential privacy invaders, etc.) rather than on the inhabitants of the house.

- 1 The intelligent building has also been known by similar expressions, such as “the smart house” or “the digital house.” We do not differentiate between these terms but simply consider them different expressions of the same concept of futuristic housing dominated by pervasive technologies.
- 2 David Lyon, *Surveillance Society, Issues in Society* (Buckingham: Open University, 2001).
- 3 Oscar H. Gandy, *The Panopticon Sort: a Political Economy of Personal Information*, *Critical studies in communication and in the cultural industries* (Boulder, CO.: Westview, 1993).
- 4 Kirstie Ball and David C. Wilson, “Power, Control and Computer-based Performance Monitoring: Repertoires, Resistance, and Subjectivities,” *Organization Studies* 21:3 (May 2000): 539–65.
- 5 A. Albrechtslund and L. Dubbeld, “The Plays and Arts of Surveillance: Studying Surveillance as Entertainment,” *Surveillance & Society* 3:2 (2005): 216–21.
- 6 Anders Albrechtslund, “Online Social Networking as Participatory Surveillance,” *First Monday*, <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2142/1949> (accessed 2008).

This focus reduces the inhabitants to passive subjects in a power relation—whether for care or control—and we argue that this understanding of what surveillance can be is inadequate. It reflects a vertical, hierarchical power relation between the watcher and the watched, which is represented in familiar metaphors such as Big Brother and Panopticon. This understanding of surveillance puts the power into the hands of the watcher while the watched is more or less a passive subject of control.

Thus, the Panopticon and the inherent conception of surveillance do not sufficiently articulate the role of the inhabitants. We argue that the inhabitants of the intelligent house play an active role, taking part in their own surveillance. With reference to a case, we argue that participatory design methods can be a way of involving and positioning inhabitants as active users in more horizontal relationships with designers and surveillance technologies. However, to avoid founding such processes on the problematic dichotomy of care vs. control, we argue that the concept of *participatory surveillance* can be useful for design researchers and practitioners.

We present this concept as an alternative to the conventional understanding of surveillance as a hierarchical system of power to explain what it is like to inhabit the intelligent house. Here, the practice of surveillance is seen as mutual and horizontal, which offers the inhabitants an active, potentially empowering role. The article proceeds as follows: First, we examine the contrasting visions of the intelligent house and discuss the intelligent house as home. Second, we introduce the FEEDBACK Project as an example of the intelligent building in development. The case is used to highlight the importance of involving and positioning the users or inhabitant as actors, and to illustrate that the discourse of privacy opposite care is an inadequate theoretical and discursive framework. Finally, we focus on the inhabitants of the intelligent house and how the idea of participatory surveillance can enrich design practices and concepts.

Dream and Nightmare

Interestingly, the idea of “the house of the future” has a rather extensive history, which carries a dream of efficiency for homes and at workplaces.⁷ Efficiency has been a focal point for housing of the future; for example, F. W. Taylor’s *Principles of Scientific Management* (1911) introduced efficiency as a primary virtue of American culture, and the effect of this way of thinking was so profound that it became a matter of course. Efficiency and rationalization are also evident in the European tradition of architecture; Le Corbusier, for example, famously referred to his houses as “machines à habiter” in his book, *Vers une architecture*.⁸ These “living machines” were a purist response to the demands of the machine age; stripped of all kinds of superfluous ornaments, they suggest the efficiency of the factory assembly line. These houses, well suited for mass production, were

7 Genevieve Bell and Joseph Kaye, “Designing Technology for Domestic Spaces,” *Gastronomica* 2:2 (Spring 2002): 46–62.

8 Le Corbusier, *Vers une Architecture*, Collection Architectures (Paris: Arthaud, 1977).

in part an expression of Le Corbusier's fascination with machine aesthetic and in part a suggestion to solve the rapidly growing housing problems.⁹

Taylorism and living machines express a desire to rationalize the procedures within the house. The idea of this desire to create the most efficient way of organizing family and work life is embedded in the walls and spaces of the future. This vision of the future is also well-known from popular culture. America has been presented with parodies of future living; consider, for example, the animated television series *The Jetsons*, which is always reminiscent of the nuclear family ideals, but equipped with robots, video phones, and voice-automated appliances. In the late 1990s, *Big Brother* emerged as a popular European television show, and it has been suggested that future living and working environments might be as transparent as a Big Brother house, thus leading to concerns that the dream of efficiency might turn into a privacy nightmare.

Whether dream or nightmare, the intelligent building has to some extent become a house of the present. Today, many homes and workplaces have appliances and systems that are automated, adaptive, and able to be controlled remotely. Examples range from systems for watering plants and controlling heating, lighting, and door and window shutters to more advanced systems that control security and entertainment. In addition to preserving energy and reducing maintenance, these systems have the potential to facilitate an easier everyday life; thus, the elderly and disabled have often been seen as a primary target group for intelligent buildings.

Home and Workplace

A prevalent idea is the home as the symbol of privacy, or even the home as the geographical place of privacy. However, the home as a retreat from the world has changed to be a more transparent place. When we use mobile phones, computers with an Internet connection, and other similar devices, we connect our home to the world in a different way than was previously possible. The Internet in particular opens the home to a two-way flow of information. Although the home is still a place for privacy and mundane living, it also has become a mixed zone with many openings to the world (including the Internet) that can empower the inhabitants.

Workplaces have many forms and variations, and, historically, they have changed from one-person craftsman places via panoptic factory floors to modern-day office environments. However, today there is not necessarily any contrast between being at home and being at work. Obviously, some people work from home—at least some of the time—but designated workplaces also can have an air of hominess. Office employees can feel at home at their workstation, which can be made homelike using personal belongings, such as family pictures and artifacts that are meaningful to the worker. Other work environments encourage hominess by creating a living

9 Dominic Gallagher, "From Here to Modernity Architects—Le Corbusier," http://www.open2.net/modernity/4_1.htm (accessed January 30, 2008).

room-feel at the office. A notorious example of a domestic-like workplace is the “Googleplex” in Mountain View, CA, which is the world headquarters of Google, Inc. Here, three or four workers share an office space “with couches and dogs,”¹⁰ which underlines the company’s determination to create a continuum from work to home. In a workplace like this, the workforce is often considered to be like a family, and it seems that the only things missing here are beds and children. Undoubtedly, this environment is very far from the bureaucratic, industrial workplace.

Thus, the architecture of workplaces can be seen as representing a certain work ideology. The panoptic space of the industrial factory represented a hierarchical structure of disciplinary procedures while a modern-day office environment (e.g., the Googleplex) represents a different work ideology or corporate culture.¹¹

Therefore, home and workplace do not correspond to private life and public life, respectively, because employees can sometimes work from home just as workplaces can have a home-like orientation. As a result, home and workplace are mixed zones with regard to surveillance. Traditionally, the idea of employee privacy has been overlooked, likely because the workplace has been considered the domain of the employer and, thus, a public place for the employees. This perspective has changed with the creation of the “homey” corporate culture, which to a certain extent acknowledges the privacy of employees at work. In the past few decades, a discussion of workplace privacy has emerged, along with legislation consolidating employee rights, including privacy concerns. Privacy discussions have often focused on technologies, with e-mail as a prominent example, and are illustrative of the conflict between private and public life in the mixed zone of the workplace. We expand on this conflict in the following paragraphs.

Surveillance, Privacy, and Care

Bentham’s idea of the Panopticon has been very influential for modern-day surveillance studies, although it was more or less disregarded¹² until Michel Foucault’s *Surveiller et Punir: Naissance de la Prison*.¹³ It has since been resurrected as a dominating conceptual framework within surveillance studies. Students of surveillance have often tried to go beyond the Panopticon, and a number of new concepts have been introduced, including “the electronic Panopticon”¹⁴ and “superpanopticon,”¹⁵ where computerized databases are discussed as a technologically enhanced realization of Panopticon.

A focal point of surveillance studies has been surveillance technologies. At first, the primary focus on technologies had to do with dataveillance (i.e., the computerization of surveillance), which has grown since the 1960s. Dataveillance gives rise to a number of concerns relating to massive generation and processing of (personal)

10 Google, “Google Corporate Information: Culture,” <http://www.google.com/intl/en/corporate/culture.html> (accessed January 30, 2008).

11 However, some would argue that the corporate emphasis on home-like environments is motivated by a hidden agenda of getting employees to spend more hours working than the industrial work culture of “being on the clock.”

12 David Lyon, “Bentham’s Panopticon: From Moral Architecture to Electronic Surveillance,” *Queen’s Quarterly* 98:3 (Fall 1991): 596–617.

13 Michel Foucault, *Surveiller et Punir: Naissance de la Prison* (Paris: Gallimard, 1975).

14 David Lyon, *The Electronic Eye: the Rise of Surveillance Society* (Minneapolis: University of Minnesota Press, 1994).

15 Mark Poster, *The Mode of Information: Poststructuralism and Social Context* (Chicago: University of Chicago Press, 1990).

information. Such issues are still important to deal with because computers of today are more powerful than ever. In the past few decades, many new surveillance-capable technologies have been introduced; equally important, computing has changed, which has given rise to new issues. Many of these important issues have to do with the way technology and computing have become mobile, intelligent, and pervasive. A consequence of this development is that surveillance is no longer fixed to certain places. Moreover, when technologies become “intelligent,” they become more adaptive to the environment and human behavior, and computing has been—or is about to be—embedded into everyday appliances. All these changes create new surveillance potentials at home and at work, as we have briefly outlined in the preceding section.

These developments contribute to changing the home from a retreat to a semi-transparent place. The “opening” of the home, created by information-generating technologies and the Internet connection, has brought about new surveillance issues. David Lyon has introduced the concept of “leaky containers”¹⁶ to describe how data move freely between different sectors in today’s society, and the idea also seems to be appropriate in the context of the intelligent building. Before the heavy computerization of the current era, the “containers” did not leak to the same degree. Information about people from specific contexts (e.g., sports club, school, shopping, work, etc.) did not mix; rather, the information was contained within that particular area of activity. Furthermore, the different sectors (public, private, consumption, education, etc.), now computerized, generate much more information than before. Lyon rightly argues that the mixing of information is of great importance to commercial industries in their effort to profile consumers.

Today, the home itself—as a geographical place—could be considered a leaky container because the information-generating technologies and the Internet connections have perforated the walls of a modern-day house. Many homes today are sites for all kinds of activities that formerly did not take place within a household, in that a lot of people are working from home, at least some days. In addition, both the Internet and television facilitate extensive shopping and an active social life. In this way, new practices of surveillance have an element of entertainment, empowerment, and social interaction that goes beyond the household.

Thus, private life and work life are blending, and to help both at home and at work, intelligent technologies and pervasive computing contribute to the massive amounts of information generated. However, the inhabitants are more or less forgotten.¹⁷ The focus on efficiency and rationalization, as well as on control and privacy invasion, seems in many cases to have left out any consideration of houses as people’s homes and workplaces; the people, in other words, are reduced to passive carriers of data.

16 David Lyon, *Surveillance Society, Issues in Society* (Buckingham: Open University, 2001), 37–48.

17 Genevieve Bell and Joseph Kaye, “Designing Technology for Domestic Spaces,” *Gastronomica* 2:2 (Spring 2002): 46–62.

The FEEDBACK Project: Reducing Power Consumption

The FEEDBACK project was intended to motivate electricity savings in private households; it was a research project, running from 2006–2007, that involved Danish universities and business partners (i.e., software companies, hardware companies, and electricity suppliers) and that was carried out by our colleagues.¹⁸ The goals of the project were to develop and test new concepts for feedback from the electrical power industry to end-users, and to study whether this feedback would result in reduced energy consumption. The various web-based and mobile technologies being tested in the project aimed at creating a space for more intelligent measuring and up-to-date visualizations of power consumption in the home, such as more detailed consumption graphs for individual household appliances that would enable easy comparison of power consumption on a day-to-day, weekly, or monthly basis.

The point of introducing the case is not to present or discuss the actual designs or technologies emanating from the process; rather, the aim is to emphasize the processes through which these intelligent house technologies were designed. The FEEDBACK Project was composed of three sub-projects, and in this paper we focus on presenting the part based on user-driven innovation.

The design approach in the project was rooted in the Scandinavian tradition of participatory design, and throughout the project eight families participated in a number of activities arranged or framed by the researchers/designers. The activities took place either in the field (i.e., the private households) or in a design space intended to evoke user-driven innovation,¹⁹ alternating between the two. The design process was composed of six steps, during which there was continuous awareness of establishing *cooperation* between designers and innovators.

The first step of the design process did not directly involve the users but involved preparing and designing artifacts for the first intervention that would involve them. The subsequent design activity took place in the private households, where the families were asked to play a card game invented by the designers. The intention of the card game was to spur reflections on power consumption. (Each family member could play a card featuring an electrical appliance, and the one with the lowest energy consumption would win the round.) Thereafter, the families were asked to take ten photographs with a Polaroid camera of electrical appliances and write questions about them. For example, does an LCD monitor use less electricity than an old CRT monitor? How much energy does an aquarium use in a year? This activity was initiated not just to get the families to reflect on their habits and needs, but also to generate ideas regarding what information might be relevant in relation to electricity consumption. Finally, the families were given the concept prototypes, a “probing kit,” and an explanation for the use of both. The probing kit included a series of postcards, which

18 Anne-Marie Kanstrup and Ellen Christiansen, “Selecting and evoking innovators: combining democracy and creativity,” in *Proceedings of the 4th Nordic conference on Human-computer interaction: changing roles* (Oslo, Norway: ACM, 2006), 321–30, <http://doi.acm.org/10.1145/1182475.1182509>. (accessed June 16, 2011).

19 Ibid.

were to be mailed to the researchers at certain times and served as a means for the families to reflect on their use of the prototypes and their electricity consumption. Meanwhile, the researchers planned a workshop in which the families were invited to produce new prototypes/mock-ups using and working in the Laboratory for User-Driven Innovation.

These activities led to a final conceptual interface design grounded in the various design activities. The concepts and designs were then translated into a number of interaction designs; these designs have recently been implemented as a screen solution, presented to the participating families, and subsequently installed and tested in 120 Danish households.

While the intelligent measurement and feedback of private households' power consumption does not immediately conjure images of surveillance or intrusion of privacy, there are certainly issues of privacy and surveillance at stake. What we can draw out from the case is the way in which users are involved in the design processes. In this case, the relationships between designers and users are more horizontal and participatory as users are actively involved in shaping the development of the technologies. Users are not positioned as either passive receivers of technological wonders or as victims under scrutiny of the disciplinary gaze; rather, users are positioned as active role-players or co-developers of the technologies.

Therefore, both the dystopian discourses concerning the surveillance practices and the utopian dreams of efficiency are inadequate in understanding and conceptualizing this case. We explore the necessity of a different approach in the following section by outlining the main discourses in surveillance studies and by suggesting the conceptual alternative, which we call "participatory surveillance."

The FEEDBACK Project: Conceptualizing Surveillance

Although intelligent feedback on power consumption does not immediately connote a Panopticon, the technologies could, from a critical perspective, be interpreted as a disciplinary gaze inducing self-monitoring and adjustment of user-behavior. In addition, the web-based and mobile technologies could lead to questions regarding sharing and access. An outcome of one of the sub-projects within the FEEDBACK Project was a suggestion to compare electricity savings online, thus encouraging competition with other families. Within the family, dynamics might be changed if parents or kids survey in detail the others' power consumption. (One might imagine scenarios where kids' allowances could become dependent on their power saving capabilities.)

While it is important to continuously ensure privacy, security, and trust as much as possible, it is equally important to raise the question of surveillance to a conceptual level in an effort

to throw light on the metaphors behind the concerns, as well as on the discourse itself. The ethical concerns are closely connected to the Panopticon and Big Brother as metaphors of omnipresent control. In light of these metaphors and the privacy discourse, any development that increases surveillance and the ability to monitor people is understood as a step in the wrong direction. Therefore, all developments seem to involve a dilemma—namely, the choice of development over ethics. From a privacy perspective, we embark upon a difficult journey of dilemmas when houses become intelligent. Architects, designers, and inhabitants are faced with the question: Are the benefits worth the loss of privacy? It seems like a case of wanting to have one's cake and eat it, too.

Many designers focus on surveillance as care rather than as privacy invasion. Instead of the looming dangers, surveillance is interpreted as the capacity to watch *over* people. It can seem novel to accentuate the caring, "positive," and helping aspects rather than the *comme il faut* understanding of surveillance as an apparatus of control. However, this shift of discourse does not really overcome the dichotomy of care vs. control. In fact, it merely revises the Big Brother perspective, and it does not adequately address the role of the user or the inhabitant (or tackle the privacy concerns).

The two contrasting views on surveillance—efficiency and care opposite privacy and control—can be described as two sides of the same coin. This metaphor is meant to illustrate that even though the two visions oppose each other, they both focus less on the inhabitants and more on the house or technology itself, as well as incoming threats/assistance from the outside. Moreover, the two conceptions complement each other: The privacy/control perspective in its "pure" form often misses out on the intentions connected with the intelligent house because the pervasive monitoring technologies are most likely not intended to invade privacy or to control. That such technologies *might be* all these things is, of course, the reason why concerns relating to privacy and control are important to deal with. However, an adequate analysis must acknowledge that these undesirable aspects most often are side effects rather than intentions. Conversely, a "pure" efficiency/care perspective misses out on the potential dangers inherent in pervasive surveillance systems. Even though the intelligent house is conceived as a caring environment and something of great benefit for users such as the elderly and disabled, there will always be a risk of misuse, mistakes, and privacy invasion.

We suggest that many of the unintended, and potentially problematic, consequences may be lessened by involving actual users in the design of the technologies—in particular because practices that might seem problematic from a theoretical perspective could be interpreted very differently by the users, depending on the specific context. For instance, families might not find it problematic to share their power consumption data with each other and compete with

their neighbors or friends on “who can save the most.” On the other hand, they might find it problematic if the data were used by the government to filter out families to be sent to educational camps on power saving. To understand the key differences at stake, we must take into account the perspective of the inhabitants and involve the users in design of the technologies. Thus, surveillance technologies do not become merely tools for repression, but also something that can involve and empower users, supporting and adapting to their activities. Achieving this perspective, however, requires more than just involving the users. It requires that we fundamentally rethink the dichotomy of care vs. control and conceptualize surveillance technologies in alternative ways.

Participatory Surveillance Technologies

As mentioned, both efficiency/care and privacy/control are important, and precautionary measures should be taken to balance the two when designing, for example, intelligent buildings. In the following paragraphs, however, we call attention to three aspects that are missing or underdeveloped in the two opposing perspectives discussed. We are not suggesting that either innovative thinking about efficiency or privacy concerns should be left behind by designers. Rather, we suggest an additional layer of conceptual thinking that shifts the focus from ways to improve the built structure or technology itself to the role of the inhabitants. The aim of this shift is to develop the idea that inhabitants can play an active role, rather than being captured by adaptive devices in an intelligent building. The three aspects on which we focus are: 1) surveillance relations as mutual and horizontal; 2) the empowering of the inhabitants; and 3) the understanding of surveillance technologies and practices as social. Together, these three aspects form the conceptual framework that we call participatory surveillance.²⁰

A “conventional” understanding of surveillance is as a hierarchical system of power. We recognize this in Big Brother and Panopticon, both of which illustrate a vertical power relation in the gaze of the watcher who controls the watched. Mutual surveillance can be considered horizontal, as the watching goes both ways; however, this kind of watching can also be considered a power relation, and one that is not necessarily even but that has the potential to empower the watched as well.

When we consider the case, some services are meant for the individual or individual family alone. However, many of the monitoring and registration practices are aimed at communicating and sharing personal information with other people, and in this context, the understanding of surveillance as a hierarchical power relation does not suffice. Foucault’s famous description of the individuals in the panoptic apparatus as passive receivers of the gaze, as objects of information and never subjects in communication is inadequate.²¹ The case suggests that intelligent buildings

20 The concept, “participatory surveillance,” has been used before by Mark Poster (Poster, *The Mode of Information: Poststructuralism and Social Context*) and by T. L. Taylor (“Does WoW Change Everything?: How a PvP Server, Multinational Playerbase, and Surveillance Mod Scene Caused Me Pause,” *Games & Culture* 1:4 (October 2006): 1–20). Poster argues that today’s “circuits of communication” and databases constitute a “superpanopticon,” where individuals are not just disciplined but take active part in their own surveillance, even more by continuously contributing information to databases. Taylor uses the concept to study collaborative play in the online computer game, *World of Warcraft* (Blizzard, 2004), arguing that norms and “coercion,” and play and pleasure, are not necessarily antithetical.

21 Michel Foucault, *Surveiller et Punir: Naissance de la Prison* (Paris: Gallimard, 1975), 234.

are not Panopticons because they facilitate mutual relations and communication. Thus, the inhabitants are not passive objects but are subjects actively taking part in a horizontal surveillance relation. For instance, the increased transparency of power consumption within the household (or between households) can become a means for the families to change their practices as they see fit, rather than a vertical power struggle between families and electricity providers.

Further, when we focus on power, the hierarchical understanding of surveillance empowers the watcher who controls the watched. In the case of hierarchies in the Orwellian sense, this relation is part of the destruction of the subjectivity under surveillance and the effort to render the lifeworld meaningless. When we return to the case and the idea of mutual, horizontal surveillance, we find another type of power relation at play. Here, it is not about the erosion of subjectivity and lifeworld. Rather, the power relation is reversed because surveillance can be part of the *building* of subjectivity and of making sense in the lifeworld. In the case, the inhabitants can be empowered because the monitoring and registration facilitates new practices, ways of constructing identity, and socializing. Again, the role of the inhabitants is changed from passive to active, and the surveillance technologies offer opportunities to seek information, communicate, and take action.

Insofar as surveillance in the intelligent house is mutual and horizontal, as well as empowering, it makes sense to understand these technologies and practices as fundamentally social. Our relations to an intelligent system are communicative, and this perspective implies a shift in thinking from trading to sharing. Personal information shared with the system should not be considered a commodity for trading (e.g., privacy for efficiency). Rather, this sharing is the basis for personal empowerment and social interaction, which can be part of both work activities and leisure alike. The mutual, empowering, and social surveillance of the intelligent house is similar to surveillance practices known from online social networking sites (e.g., Facebook and MySpace). On the web, the dynamics of social life also have to do with communication and the sharing of personal information. The personal information that people share (e.g., name, interests, birthday, political and religious views, activities, etc.) represent a level of communication that has to be neither told nor asked for. It is just “out there,” untold and unasked, but something that is known and part of the socializing. In other words, self-surveillance is a positive basis for socializing practices on the web. As in the case, online social networking sites facilitate a mediated social space that requires participation of the users. Hence, these examples show how social interaction can be anchored in surveillance practices—on the web and in the intelligent house.

Thus, the idea of sharing oneself with another person or a community is not an addendum to the relation; rather, social

interaction is *based on* voluntary sharing of information. It must be stressed that this form of inhabitant participation is very different from the pseudo-participation known from the Panopticon and *Nineteen Eighty-Four*. In both of these, disciplinary practices disempower the subject of surveillance and in neither are the inhabitants engaging in true social interaction.

In terms of design, the concept of participatory surveillance poses new challenges. Regardless of the theoretical approach to design, it makes good sense to incorporate the aspects discussed. As stressed earlier, creating a caring environment while minimizing the potential privacy threats must still be a focal point of the design process. Consequently, a wide variety of surveillance relations—vertical as well as horizontal—must be taken into consideration. The challenge is to actively include the inhabitants in this process so that all might fully tap into the potentials of intelligent buildings. We suggest that using participatory design methods and involving users at different levels may position inhabitants as active users in more horizontal relationships with designers and surveillance technologies. However, this practice also requires that we avoid thinking of surveillance technologies as either vehicles of care or control, and recognize the complexity of the social contexts in which the technologies operate. To this end, we argue that the notion of participatory surveillance may be a helpful conceptual tool in overcoming the dichotomy without neglecting the very relevant issues of care and control.

Conclusion

The futuristic, technologically enhanced house seems to be just around the corner, as an environment that has the potentials to empower people at home and at work. After studying house, home, and workplace and discussing different contexts of surveillance, we can offer at least three conclusions. First, surveillance must be recognized as something that can *also* build subjectivity, facilitate socializing, and empower those who are “watched.” Second, to make this recognition possible, we must turn our attention even more to the active, empowered inhabitant and involve them in design processes. This turning is a challenge for those who design today’s working and living spaces, and we suggest that participatory design methods informed by a conceptual understanding of participatory surveillance could be a promising trajectory. Third, further development of these concepts is necessary to adequately and accurately describe this form of surveillance, and the notion of participatory surveillance is a suggestion to that end.

These conclusions represent new challenges for designers. As pointed out by others,²² designers must overcome the paradox of a design focus on buildings rather than on inhabitants. Furthermore, simply involving users in the design processes is not enough; it is equally important to overcome the dichotomy between caring and

22 Genevieve Bell and Joseph Kaye, “Designing Technology for Domestic Spaces,” *Gastronomica* 2:2 (Spring 2002): 46–62.

control because as such discourses serve as the conceptual foundation from which designs are developed. Design practices are indirectly or explicitly based on frameworks that circumscribe ways of thinking, understanding, and conceptualizing situations, and a constraining framework generates inadequate vision for the development of intelligent buildings. The ambition of this paper is to explore new ways of thinking in relation to design processes, introducing the basic ideas of participatory surveillance so that moving beyond the constraint of current frameworks becomes possible.