

Ubiquitous computing, empathy and the self

Soraj Hongladarom

Received: 5 October 2011 / Accepted: 20 January 2012 / Published online: 9 February 2012
© Springer-Verlag London Limited 2012

Abstract The paper discusses ubiquitous computing and the conception of the self, especially the question how the self should be understood in the environment pervaded by ubiquitous computing, and how ubiquitous computing makes possible direct empathy where each person or self connected through the network has direct access to others' thoughts and feelings. Starting from a conception of self, which is essentially distributed, composite and constituted through information, the paper argues that when a number of selves are connected to one another in the ubiquitous computing network, a possibility opens up where the selves can directly communicate with one another. This has a potential finally to solve the problem of other minds, and in fact any philosophical conundrum based on the supposed distinction between self and the world. When selves have direct access to others' thoughts and feelings, they know the content of others' mental states directly without having to make inferences or employing some other indirect methods. As they are interconnected through the ubiquitous network, and as they are essentially constituted through information, the selves then are spread out across the network. What this implies is that any boundary between a self and another is not as hard and fast as hitherto may have been understood. Toward the end, the paper also discusses how freedom and autonomy are still possible in this ubiquitously networked world.

Keywords Ubiquitous computing · Self · Empathy · Person · Identity · Freedom · Autonomy

S. Hongladarom (✉)
Department of Philosophy and Center for Ethics of Science
and Technology, Chulalongkorn University, Bangkok, Thailand
e-mail: s.hongladarom@gmail.com

1 Introduction

Ubiquitous computing is a new kind of computing technology where the computing power resides not only in the computers with which we are all familiar, but also in everyday, familiar devices not usually thought of as computing. A refrigerator, for example, is not usually thought of as a computing device, but with ubiquitous computing technology, the refrigerator can become enmeshed in a wide ranging network that receives and sends signals through wireless networks. In this sense, the refrigerator becomes “smart” in the sense that it can “make a decision” to send out signals to the grocery store if certain segment of the stuff inside is running out. If allowed, this signaling can take place without the owner being notified, just as certain programs in today's computer can update themselves through the network without having to ask for permission explicitly from the owner every time. According to Mark Weiser (1991, 1993a, b), the technology should make itself disappear by weaving itself into the fabric of everyday life. This is to say that the computing technology will become ubiquitous through having thoroughly and imperceptibly permeated into our lives so that, in effect, computing devices and our normal lives will become one.¹

In this paper, I would like to discuss ubiquitous computing and the conception of the self, how the self should

¹ There are currently many terms that refer to closely related phenomenon. Apart from “ubiquitous computing,” another phrase that is being used is “pervasive computing.” According to the National Institute of Standards and Technologies (NITS), *pervasive* computing refers to devices that are numerous, casually accessible, often invisible; thus, it is essentially the same kind of technology as ubiquitous computing. In fact, the two terms are being used interchangeably in the literature (NITS 2001).

be understood in the environment pervaded by ubiquitous computing. I would like to start from a conception of self, which is essentially distributed and composite (in short a “Buddhist” conception of the self), and argue further that when a number of these selves are connected to one another in the ubiquitous computing network, a possibility opens up where the selves can directly communicate and hence be directly empathetic toward one another. The point about the self—the actual referent of the first-person pronoun “I”²—being composite is not new in the scholarly literature. What I am presenting here, in other words, is that when these selves are connected with one another they can communicate directly, which has strong implications for empathy and the hitherto intractable philosophical problems of how to know other minds. I argue that a way emerges, through the conceptual possibility of ubiquitous computing, that allows for these selves to have empathetic knowledge and feelings of the other selves, which is not possible before. In other words, the selves connected through the network can have direct access to one another’s thoughts and feelings. That is, ubiquitous computing provides support to the idea that the self lacks a core identity in such a way that there is no actual mental or physical entity that functions directly as someone’s self. Furthermore, as many selves are able to be connected through the network, they can directly communicate with one another so that real empathy can result.

Following the works of psychologists Jerome Bruner, I call this kind of self “distributed self” (Bruner 1990, p. 107ff; Stevens 1996). According to Bruner, the self should be understood not as a unitary entity that stays fixed, but essentially social and contextual (See also Gergen 1991, 1994; and Shotter 1993).³ However, the difference between the psychologists’ conception and the one offered here is that my version of the distributed self extends over the technological network rather than through a social one. More importantly, the distribution is not there only within an individual self, but the selves in themselves are being distributed on the network in such a way that there are distributions of many individual selves that are communicating and interacting with one another. What connects the

distributed self with ubiquitous computing is that the former is constituted through a set of information, and as information can be manipulated across widely distributed networks through ubiquitous computing, the self can be distributed too. Hence one could consistently say that the self does exist across the network.

It should be noted, however, that distribution of the self through some kind of technology is not new. For example, writing a letter is a form of distribution of the self of the writer because when the writer is writing her letter, it is certainly possible that she is pouring her heart and soul into the letter. The writer’s heart and soul, metaphorically speaking of course, is there in the letter, and since heart and soul are what constitute the self of the writer, it can be said that the self of the writer is also found in the letter. In this regard, the ubiquitous network, which allows for instantaneous transmission and reception of information, does extend the self in the same way, though it is much faster. And when the self is thus extended, it touches other selves, the selves of other people. In the old time, empathy resulted from observing others’ outward behaviors, such as grimaces on the face showing pain, but in the era of ubiquitous computing, there is a possibility that such means of empathetic knowledge can be direct. Information related to the state of someone’s thoughts and feelings can be transmitted directly on the network to be picked up by others. Instead of a nightmarish scenario where individual privacy is threatened, I would like to say that this augurs a positive context where empathetic knowledge can be demonstrated conclusively.

The phenomenon I am discussing here has a profound implication on what it is to be human in the age of pervasive or ubiquitous computing (Weiser 1993a, b). A consequence of the ubiquitous or pervasive computing phenomenon is that we seem to be witnessing a merging together of what is essentially human, the self, with the network. Not only is information created on someone being distributed throughout the network, but information directly pertaining to one’s physical body itself can be so distributed too. Sensors attached to our skin, for example, can monitor our bodily information such as blood pressure and so on and send it out across the network. This seems to imply that what is human might not be limited to the extent of our skin any longer. Moreover, the merging of human bodies to the physical computing network has an interesting implication on how human beings communicate and interact with one another. Without the ability to get connected in this way, humans have had to imagine what it would be like to be in someone else’s shoes, so to speak. We have had to depend on our imagination to think what it would be like to be someone else, to think the thoughts the other is thinking and to feel what the other is feeling. This ability is not only useful for actors, but everyone benefits

² In this paper, I take the self to refer to the referent of the first-person pronoun, namely what is being talked about when one refers to oneself using words like “I,” “me” or “mine.” It is this sense that is the basis of the philosophical problem surrounding the self. It is this referent of “I” that is the subject of knowledge and subject of moral deliberation.

³ This view finds its support in Buddhist philosophy, which argues basically that the self, as commonly understood, does not actually exist. See Mark Siderits’ “Buddhist Non-Self: The No Owner’s Manual” (2011) and also Siderits (2007, 2003). However, this position is criticized by Dan Zahavi in the same volume (2011). See also Zahavi (2009).

from this as there is a recent research showing that empathy, the ability to know others' thoughts and feelings, is a key ingredient in lessening evil (Baron-Cohen 2011). Thus, the connection also has a very strong positive impact on our lives. Furthermore, the situation may give rise to a concern that there is a danger of loss of autonomy. As machines are growing stronger and becoming more capable of analyzing and manipulating data intimately related to our bodies and minds, they are becoming more like us.

I would like to show, on the contrary, that humans still have the ability to make autonomous choices. These choices, however, will be more mediated by the machine, since the two are beginning to be merged together. A point I am making in this paper is that the fear of humans losing their autonomy is tenable only if one draws a clear line between humans and machines. When the line is fuzzy, it is more difficult to see exactly who is losing autonomy to whom. The point is this: Even if we humans all migrate to live inside a silicon-based body, we still keep our autonomy because in a sense, the machines are *us*. If this is the case, then the basic question of autonomy will shift from whether humans can be autonomous, or whether machines can really be autonomous, to whether the human-machine hybrid that will emerge will ever become autonomous. I would venture to say, in a qualified way, that the answer is yes. There does not seem to be anything wrong for a machine or a human-machine hybrid to be autonomous (There is certainly another sense which is widely in use where a robot can be "autonomous." In this sense, the robot is capable of acting on its own to a certain extent without human guidance; an example is a robot car that can drive and navigate the road on its own. However, the sense of "autonomous" I am using here is much deeper. It refers to the capability of acting on its own and taking responsibility for it, which can only be the case if the agent is fully conscious and self-aware.) The issue depends on a conception of consciousness and the self, but if there is ever a scenario where machines behave exactly like us in every way, then there does not seem to be a point where humans can deny that the machines are conscious.

2 Ubiquitous network and distribution of the self

In my earlier paper (Hongladarom 2011a), I have sketched a notion of the distributed self where there is a sense in which the self, in a certain sense, is spread across the ubiquitous network. This notion is rather similar to that proposed by psychologists such as Bruner (1990), Gergen (1991, 1994), Shotter (1993) and Stanton (1999). According to Stanton, "[t]he self is heterogeneously distributed because a coherent self emerges from the interconnection of structures of diverse sorts, which together facilitate the

experience and manifestation of a coherent identity" (Stanton 1999, p. 155). Here, I would like to present further arguments in support of this conclusion. In the earlier paper, the argument is that the self is constituted through information, and when information is distributed across the network, it can be said that the self is distributed too. An obvious rejoinder to this argument is that it does not make much sense to say that the self can exist outside of the body. I argued in that paper that the self could in a certain manner be found in other places outside of the body where information pertaining to the self is found. For example, when an artist creates a piece of creative art that reflects her own personal thoughts and feelings, it can be said that the artist's self is there in the work (See, for example, Manzotti 2011). In the same vein, with ubiquitous computing when information about a person is being distributed through the network, it can also be said that the self is so distributed. The rejoinder would be that the artwork does not constitute the self of the artist, for the artwork can certainly survive even if the artist is no more. The fact that we have numerous artistic works that survive their creators obviously shows that the selves of the artists are not there in the works.

In a sense, this is clearly the case. Much depends on what is understood with the term "self." If the self is understood to be limited at the skin of the body, then obviously the creation cannot be the self. In other words, if the self and the body are coextensive such that what lies outside of the body cannot be the self, then there is no sense in which the artwork can be part of the artist's self. However, there is another sense of talking about the self where one says that the artist's own personality, her thoughts and feelings, are there in the work. One might object that this is only a metaphorical way of speaking, but metaphors are based in deeper reality, which ground the similarities that are being compared. In this sense, the work constitutes part of the self of the artist just as the artist's thoughts and feelings, expressed in words, are part and parcel of her own self. We know what the artist is thinking and feeling and many things else through understanding these expressed thoughts and feelings. In a way, these expressions are the windows through which one can get into contact with the self of the artist. Even when the artist herself is no longer there, we can still get a glimpse of her inner thoughts, her emotions, dreams, desires, memories and so on, through these expressions. And what more could one expect from someone's self beyond these thoughts and emotions?

Perhaps the problem lies with perspectives. In objecting to the idea that the self can be distributed through the expressions of thoughts and desires or through other forms of information, one seems to presuppose that the self must be seen from first-person perspective. That is, if anything

can be a self, it somehow has to be able to function as a standpoint from which a kind of first-person perspective is based. I know that I am a self because I am thinking and feeling, and I know that the coffee cup in front of me is not a part of my own self because it just cannot be conscious, let alone be conscious as *me*. Thus, to say that the self is distributed across the network would be, in this view, tenable if a node that contains some information about someone's self can be conscious and can view the world from *its own* perspective. Nonetheless, there are a growing number of researches and philosophical arguments purporting to show that the first-person perspective is only a way in which the self is represented, and does not *constitute* the self.

According to Damasio (2003), pp. 207–208, the self is nothing more than a way the organism represents itself to itself, which is an expedient way for the organism to group the representations it is making together in such a way that they belong to one organism, namely itself. Without a sense of self, it is hard to imagine that advanced life like that of a human being can be properly managed. This is because the sense of self relates the thoughts, emotions, feelings that occur as a result of the brain's activities so that they respond to the same organism, the same one that is the owner of these thoughts and feelings from the beginning. Without this ability, thoughts, feelings and emotions would have no means to bind them together and so become ineffective in helping the organism navigate and survive in the environment. According to Damasio, what the sense of self brings to this picture is one of orientation where large-scale integration of different sense modalities can be performed (Damasio 2003, p. 208).

What emerges from Damasio's analysis of the self is that it is not a thing as perhaps commonly understood; rather, the self is what is referred to when the organism is referring back to itself as one and the same thing over time. What is exactly being referred to is in fact composed of many components, and it is entirely possible that there is not one single, enduring thing that remains as the core referent of the orientation. What is being referred to here when an organism refers to itself might be its mental episodes or its bodily parts, or a combination of the two. But if the self can be more accurately understood as emerging from an orientation, then perhaps there could be an orientation to episodes outside of the body proper where calling them a self might not be too inappropriate. A consequence of ubiquitous computing is that the boundary between the body and what lies outside it is becoming blurred. As one refers to one's "self" when one uses the first-person pronoun, "I," "me" or "mine," what is being referred to can be an episode of the mind or a part of the body, or some kind of combination of the two. When a

body or a mental episode is referred in this way, then it becomes part of the self of the one who refers. When information can be transmitted automatically from the body to the network, in effect it is the body itself that is spreading through the network. In other words, the body itself is becoming a node in the network; hence, when information is exchanged freely between the original body and other nodes, parts of the body can be found in the other nodes too. Thus, it is quite plausible that the components that make up a self do not necessarily belong to the body of the organism. This linking of the body and the network will be more pronounced and visible when more information is exchanged and when the original body itself interacts physically with the network. When there is a linking between the body and machines, for example, in effect the machines then become parts of the body. If I have a prosthetic limb, then it becomes a part of my body; and if there is a network connection between some mechanical parts attached to my biological body to some computing device in a remote location such that I can somehow control the remote device merely by willing it, then the device in effect also becomes another part of my body. In other words, there could be an orientation where the remote device can become a part of my own self too.

In this way, then, my body can be extended through the network. If I can will a remote device to work according to my wish, and if I become so good at it that I am not conscious any more than it is a remote device that is not part of my original body from the beginning, then it for all intent and purposes becomes a part of my body. In fact, my ability to control the remote device according to my wish also shows that my mind is also distributed over the network. A natural consequence of this is that I grow an attachment toward that part. I would say, this remote device is mine, or even is "me." This is certainly plausible if the device and I become so merged that I am not always conscious of the fact that the device is not part of my body from the beginning. But if the remote device can become "me," then my own self is certainly extended across the network.

This extension of the body, the mind and the self mentioned here seems to work because I can control the remote device. This is certainly possible with pervasive or ubiquitous computing and human–machine interaction. But what about the more mundane issue of sensors attached to the physical body sending out signals to a server? There is no way I can control the server that processes my bodily information in the same way as I can control my prosthetic limb, so is the server or the sensor parts of my body or my self? But if it is the case that information that is being sent out constitutes my self, then it seems clear that the self is extended across the network in this way too. But how is the self constituted by information?

2.1 Self constituted by information

Susan Blackmore has argued for the existence of memes that constitute conceptions of a self in an individual (Blackmore 1999, 2003). Memes are self-replicating ideas that compete with one another for survival through successes in copying themselves. Hence, memes are analogs of genes that also compete among themselves to get replicated so that they can pass on their genetic heritage to the next generation of biological organism (Dawkins 2006). Blackmore also agrees with many other scholars and scientists that there is no such thing as an independent, subsisting self that stands over and above the mind's representations, and for Blackmore, these representations themselves are memes. According to Blackmore, the illusion that there is a self over and above one's representations arises when the memes arise when the memes see an advantage in doing so. Believing that there is an "I" who owns the representations or the memes and tie them up together to form an enduring self so that I can cherish and pamper it helps in propagating the memes that happen to belong to "me." Memes that are taken to be "mine" stand much better chance of getting replicated than memes that are not (Blackmore 2003). In this sense, the self is nothing but a bundle of memes all competing with one another for the chance to get replicated. There is a meme which might be called an "I" meme which is very advantageous because it can conjure up all the memes and form an existing self. The "I" meme then functions as the controller of all the memes that are taken as "mine." All those memes that are on the opposite side, those that are taken to be inimical to the "I," are then banished very rapidly from the system [called "selfplex" by Blackmore (1999, p. 231)] since they threaten the existence of the self itself.

According to Blackmore, "[t]he self is a vast memeplex—perhaps the most insidious and pervasive memeplex of all. I shall call it the 'selfplex'. The selfplex permeates all our experience and all our thinking so that we are unable to see it clearly for what it is—a bunch of memes. It comes about because our brains provide the ideal machinery on which to construct it, and our society provides the selective environment in which it thrives" (Blackmore 1999, p. 231). And the memeplex is a group of memes that come together for mutual advantage (Blackmore 1999, p. 231). Hence, for Blackmore, the self is nothing over and above the memes and memes themselves are constituted by information, because they are able to be copied and transmitted through some kind of medium. It is clear at any rate that both genes and memes are constituted by information. A gene encodes certain amount of information that enables it to pass down instructions for, say, brown eyes or fair skin; in the same vein, the memes also encode information. This is clear when we learn from

one another and copy ideas from one another very rapidly. Dawkins himself says in his book, "[w]hen you plant a fertile meme in my mind, you literally parasitize my brain, turning it into a vehicle for the meme's propagation in just the same way that a virus may parasitize the genetic mechanism of a host cell" (quoted in Aaron Lynch 1996, p. 27). Thus, Lynch calls the memes "information viruses." The point is that: If this is the case, then it is a short move to the conclusion that the self itself is constituted by information (Floridi 2011a, b and c).

Let us summarize what has been said so far. I have argued that the self is distributed through the network when information pertaining to the self or constituting it is spread there. In the example of my having prosthetic limbs or connection with some kind of device that I was not born with (such as a remote control device), I can sense that the devices belong to me and even become part of my body, hence by extension part of my own self when the interface and interaction between my mind and the device is seamless so that I am not normally conscious of the device as something that has been added on to me, but instead a part of my own conception of my own self, in the same way I am now feeling that my two hands and ten fingers are parts of my body and my self as I am typing this paper on the keyboard. My brain, my two hands and ten fingers are working seamlessly together so that my thoughts are translated into mechanical action of the fingers typing on the keyboard. Hence, if there is a remote device or a network device that blends seamlessly with my mind and brain then the device itself can well become part of my sense of self. Furthermore, as the self is constituted by information, when this self-constituting information spreads around the network, there is also a way of saying that the self itself spreads through the network too.

3 The human being in the ubiquitous computing world

If the self is distributed in the network, then it seems that the human being is distributed too. In the likely scenario, in the future when the body itself is merged with technological device, what it is to be a human will increasingly be technological. Our bodies will be more a product of design than biological evolution. Instead of the blind process of evolution, we humans appear to be in grip of the ability to create ourselves, not just narratively and conceptually, but physically according to our wishes. Here, the technology of ubiquitous computing is part of the human enhancement technologies in general. One way of enhancing the human would be to equip them with the ability to engage with the environment through the network and to have the abilities of the body extended through the network. In being a part

of the so-called “internet of things,” the human body will be enhanced in many ways.

What does it mean for the human being to be able to spread his or her body and the sense of self and the person throughout the network? One thing is that the boundary between one human being and another will become less clear than before. At present, our body and sense of self is limited by our skin, and what separates one human being from another is that I have my own body and you have yours, and the two bodies do not mix as each is encased and enveloped by the skin. However, with the ubiquitous computing network and the merging of the body, many human beings can become parts of the network and since each of the bodies will be distributed, then there will be many instances of touching and merging among the humans that are on the network. In fact, this is already happening when millions of humans are interacting with one another through social networking websites and various other forms of electronic communication. Here, there is a sense in which each user projects his or her self into the social networking site, who then interacts in various ways with their “friends.” There is a growing number of research analyzing the ontology of these online “selves” (Floridi 2011b; Olson 2011; Ward 2011; Richardson 2011; Hongladarom 2011b; Floridi 2011c); among the questions that are being asked are whether the online selves are one and the same with the normal, offline ones or are there any significant differences. I have argued that the online and offline selves are not essentially different from each other, and the philosophical and conceptual tools that have been used to account for the normal, offline self can be used to analyze the online one too (Hongladarom 2011b).

However, an interesting aspect of the self being distributed through the network is that there arises the possibility of network bodies interacting and mixing up with other bodies and other distributed selves in a way that can scarcely be imagined before. Without the ubiquitous network and the equally ubiquitous use of social networking sites such as Facebook, it is impossible for an individual to become engaged with other individuals in such an intensive manner. When bodies and selves are spread throughout the network, their interaction will not be merely the case of two skin-encased bodies talking with or touching each other, but in a sense, it will be the case of two network bodies fusing and merging with each other.

3.1 Uniqueness of the self

But if this can be the case, then what about our individuality and our uniqueness that has defined each of us as a unique person? The fact that we humans have been encased in skin-based bodies for so long may have given us a sense that our uniqueness and individuality, our sense that the

“I” in each of us feels that he or she is separate from all other “I’s” out there, is palpably there for us because we all have a body that is distinct from others. After all, we humans are not composite organisms that get together physically to accomplish a common task, such as a sponge that is composed of millions of small, independent organisms getting together to form a large organism which can achieve tasks that each single organism cannot do alone. Our bodies are not naturally attached to each other to form one giant superorganism. That is certainly a biological fact. However, with the advent of social networking sites and the fact that millions are cooperating, collaborating, communicating with one another on such an intensive scale, our selves seem to be merging with one another already even without the ubiquitous computing network that I am talking about in this paper.

We can understand this point better if we realized that our sense of individual self is not based on any kind of ontological reality. Instead, it is a construction that our minds have created because it gives the mind certain advantages. If Blackmore is right in saying that our “selves” are nothing but memeplexes, then certainly memeplexes can fuse with one another, and any kind of boundary separating one memeplex from another is necessarily contingent. Still, some may object to this point, asking what would happen to our sense of being a unique person with such a fusion. One person, so the objection goes, is different from another, but if fusion is possible, then would that imply that our unique persons would be forever lost in the network so that we ourselves would disappear. Isn’t that a very frightening situation? It would be frightening only if there is a self-subsisting, independently existing self that exists as a metaphysical entity; if this kind of self is lost, then there is a reason to be frightened because this self is exactly who we really are. But if who we really are is constituted by a variety of factors none of which can claim to be the core of the self, then it is more difficult to say when my own self is lost. In fact, the interaction and the possible fusion between the selves has already happened for a long time in the actual world outside the network. When we share ideas, feelings and thoughts with another person, we in effect are changed by the sharing because the new ideas and thoughts coming to us would be lodged inside of us that have not been there before. Since we have seen that the self is constituted through information, this sharing of ideas and thoughts will then change our own selves in significant ways. In this way, the merging of the selves on the network is only an acceleration of what is already going on in the non-network world. When the selves and the bodies of many persons are spread throughout the network, a consequence would be that it would be much easier for one person to have empathy toward others in the network. It would be much

easier for one person on the network to know what others are feeling and perhaps thinking, thus enhancing the empathy that one naturally feels toward others. As empathy is a necessary ingredient in one's feeling of compassion toward others, the enhanced empathetic feeling that is enabled by the network then will contribute greatly to a better, more compassionate world. In other words, as Baron-Cohen has shown, the world will become less evil because evil results from lack of empathy (Baron-Cohen 2011).

Another objection to the idea of fusion of the selves on the network is about the locus of the subjective orientation. Each of us has the central place from which we view the world. It provides us with a perspective from which the world comes to us and seems to give us a distinction between us who are experiencing the world and the world that is being experienced. If the self is distributed across the network and is fusing with other selves, then where is this central place of self-orientation? One consequence of the idea that selves can fuse with one another is that it will be possible to shift this center of orientation. In other words, it would be possible for each of us to experience the world as experienced by another. At present when our persons are located inside our own skin-based bodies, the only way one can know what others are feeling is through imagination. We have to imagine what it would be like to be in the other's situation and to experience the world as she does. The fact that our interaction and communication and understanding of one another's feelings and thoughts is totally necessary for effective functioning of us human beings as a community and society shows that even without the ubiquitous network, this sharing of thoughts and feelings is already happening. It is only through the radical separation of the subject and the object that we seem to think that it is not possible to know what others are feeling. Believing that our subjective self is cast inside our own body, we believe that it is only possible to know exactly our own thoughts and feelings and impossible to know those of others. However, with the selves being distributed throughout the network, it becomes easier for a self to know what others feel. There is, nonetheless, always the sense that, even if my brain is hooked up with the nervous system of another person, what I experience is still *my* own experience and not that of the owner of the nervous system because it is *my* brain that does the experiencing. There is no way of discounting this possibility because there is no way to show conclusively that the perspective from which one views the world is a contingent matter and not essentially related to one's feeling that there is a self to which one is attached. If one always bases one's thinking on the idea that there must always be a self, a cogito, that is separated from all other things in the world, then no matter how much distribution on the network is available, one would still hold on to this self. However, if one believes

that what one has been thinking of as one's own self is only one possibility among many, if, in other words, one believes that viewing the world from another perspective is possible, then it becomes easier to experience the world not as oneself, but as another. This is a key component of empathy.

There are many arguments showing that viewing the world from the perspectives of others is certainly possible. Apart from the arguments offered in Buddhist philosophy (see, e.g., Hongladarom 2007; Siderits 2007), which purport to show that the self as is commonly understood is a mere thought construction, there are also the famous argument by Spinoza to the effect that the mind and the body are essentially one and the same, as attributes of one and the same God or nature (Spinoza 1985, pp. 408–446; Nadler 2006). Both the Buddha and Spinoza take a different route toward basically the same conclusion that what is taken to be an individual self is nothing over and above a thought construction. According to Buddhism, what is taken to be the core individual self is analyzed to find its components, and these components then are further analyzed so as to find that there is nothing substantial in any of them (Collins 1982; Siderits 2007). The self, then, is constructed out of the fleeting components, a result of what Buddhists call *avidya* or ignorance, which leads to a mistaken belief that what is constructed as the self is ultimately real. In Spinoza, the individual self is understood to be a union between an individual body and an individual mind. Since everything is essentially one as indivisible part of the one God, any division of the one reality into individuals, such as persons, must be based on a kind of conceptualization that putatively separates an individual from its surrounding, and also an individual person from another person. As Spinoza believes that body and mind are essentially one and the same thing (as God), there is a strong connection between the two, and thus, what is understood as an individual self is a result of conceptualization that demarcates it from its environment, all of which are in the deeper nature one and the same. The point is that if the self of an individual A is a result of a demarcation, so must be the self of another individual B; hence, there is a clear sense in which the selves of A and B are essentially one and the same. In this way, the argument I am forwarding on the implications of the ubiquitous computing network and the self is just another aspect of the arguments about the self already made in Buddhism and in Spinoza. When the selves are distributed on the network, it merely seems to illustrate what Buddhism and Spinoza have already shown.

3.2 Empathy and the selves

If the self is constituted through information, and if information can travel easily throughout the ubiquitous

computing network, then it seems only a short hop to the conclusion that when there are many selves on the network, these selves are bound to contact, connect and communicate with one another very intimately and directly.⁴ A result is that knowledge of other minds would be on the same status epistemologically with knowledge of one's own mental content. A long tradition in Western epistemology is that the knowledge of one's own mental content has a special status because it is believed that a person always has a "privileged access" to his or her own mental content. This is so because when I have a mental content, say, an itch resulting from a mosquito bite, only I can have direct access to this itchy feeling. If you would like to know what my particular itchy feeling at this particular spot on my skin at this particular time feels like exactly, there is no way for you to be absolutely certain. All you and I can do is for me to try to describe the itch and for you to try to imagine it. This idea of first-person privileged access knowledge is central to Western epistemology because it underpins the idea that the individual is the starting point of knowledge. According to Descartes, for example, true knowledge always originates with the individual ego that has just this privileged access to first-person knowledge. According to this tradition, knowledge is always an individual enterprise. However, it has led to all kinds of familiar problems that have beset Western epistemology for centuries. The most notorious of these difficulties is the knowledge of other minds: How is it possible that I can know that you are feeling something or are even conscious?

The problem of other mind is but a version of the problem of general skepticism (the problem that we cannot know the content of the external world). When the basis of knowledge is taken to be individual mental content, it is impossible for one to know the content of the mental content of the other. All one can do is to infer from the other's behavior, which always leaves a possibility open that the other might be faking it. However, ubiquitous computing seems to do away with this difficulty. When the self is constituted through information and when many selves are connected with one another on the ubiquitous computing network, information pertaining to one self's thoughts and feelings can be accessed directly by another. This is still very far-fetched and futuristic, but as in other areas of philosophy, it is useful as a thought experiment

⁴ My argument here, then, is different from one offered by Dan Zahavi (2007), who argues that the leading accounts on the problem of other minds, namely what he calls the "theory-theory" and the "simulation theory," both suffer from a deficit stemming from the presupposition that one has to infer the content of others' minds. In the account being offered here, there is obviously no need to infer, because the content of others' mental episodes can be accessed directly via the ubiquitous network.

that demonstrates a problem with the long tradition of first-person privileged access. If it is conceivable that selves connected with one another on the network can have direct access to one another's thoughts and feelings, a way opens up to know the content of other's feelings as directly as the content of one's own. This would be the beginning of the end of the problem of other minds and with it the problem of general skepticism.⁵

Having direct access to others' thoughts and feelings means that one can have full empathy toward others. In the world where one has to infer the content of others' thoughts, empathy seems secondary. One infers from the contortion on another's face that she is suffering. But with the possibility of having direct access to the other's suffering pain, one can have full empathetic feeling toward the other. One knows directly and first hand that the other is indeed feeling and how she exactly feels. Empathy is only possible when one can either imagine or have direct experience of another's feelings, so this possibility opened up by ubiquitous computing makes having empathy toward one another all the more likely. And as we have seen, empathy is a key ingredient of solidarity and compassion, thus having direct empathetic feeling can be actually a significant step toward a less cruel and evil world (Baron-Cohen 2011).

3.3 Freedom and autonomy in the networked world

If the selves and the persons are composite entities distributed over the ubiquitous computing network, then what implications does this have on freedom and autonomy? This is an important part of the question on what is the nature of human beings in the ubiquitous computing environment. According to the standard view found, for example, in Western epistemological and political thoughts such as those of Descartes, Kant and Locke, freedom and autonomy are properties of the free and independent individual who can think on her own, view the world from her own unique perspective, and is free to act according to her own wishes. It seems, according to the standard picture, that freedom and autonomy requires a free and autonomous individual. Furthermore, an individual cannot be free and autonomous without possessing an independent self that is

⁵ An obvious rejoinder to this proposal is that it seems to do away with the existence of the selves all together. If a self can have direct access to another's first-person feeling, then it would seem that any boundary between selves would disappear, since our commonsensical notion is that the first-person access defines a boundary between the selves. However, even though selves can have direct access to each other's feelings, they still exist separately because they belong to different places or nodes on the network. Metaphysically speaking, since the very notion of a self is a construction, this implies that any putative boundary between them would be a construction too. That a self is a construction does not imply that it does not exist.

capable of making its own decisions and of standing there in opposition to all the forces in nature that seem to conspire against it. This is a very familiar picture of human beings. Thus, the distributed self view seems to undermine freedom and autonomy of individuals because it undermines that existence of the independent, self-subsisting self, or so the objection goes.

Nevertheless, it is not necessary for freedom and autonomy to depend on the existence of independent, self-subsisting self. Freedom and autonomy do not have to be properties only of the independent self, for they can also belong to the distributed self. The basic idea of freedom as belonging exclusively to the independent self is that of a self deliberating for oneself which choice she should make, whether to turn right or left, for example. Thus, freedom seems to depend on deliberation that the self is making. When the self is conscious that she makes the decision without being coerced to do so, when she realizes that she is fully free to make the decision, then she realizes that she is free to do so. Freedom depends on the ability of the mind to deliberate on its own and to be self-conscious. However, these abilities can also be performed by the distributed self. There does not seem to be anything in principle against the possibility of a distributed self to make decisions without any coercion and with full consciousness of oneself thinking freely. Making a decision, such as deciding whether to turn left or right, is just another representation that the mind presents to itself. There can also be numerous other representations as well. Making representations in this way does not require that there be a substantive self that functions as the one who calls all the shots and manages everything.

If this is the case, then the question whether humans who are connected to the network in this way will remain autonomous can be answered. One of the anxieties that many have felt as a result of the rapid advances in science and technology is that we humans will lose our autonomy. As machines are taking over our traditional tasks and as we appear to depend more and more on them, many have feared that humans will no longer be an autonomous agent. The fear is that without being an autonomous agent, there would be no human beings as we know them. We will all become zombies.

Nonetheless, I don't think there are any justified reasons for the fear. As the argument above has shown, human autonomy does not seem to be threatened by the possibility that humans can have their bodies and mental capacities extended through becoming a part of the network. When one human makes a decision, such as when she arrives at a crossroad and is making a decision whether to turn right or left, her freedom is there when she feels deep down to her bones that she is not compelled in any way. She is deliberating whether to go right or left solely on her fully

autonomous condition. The fact that she is now attached to a ubiquitous computing network does not have to threaten her autonomy any more than having two arms attached to her body does. She feels that she can move her arms freely within the limit imposed by her physical constitution. The physical constitution does not constrain her freedom; it is not that her being unable to extend her arm to grasp something twenty meters away is a constraint on her freedom as a human person. So should not her attachment to the ubiquitous network be any constraint. So long as she can freely deliberate and act on autonomous understanding, she is free, and I have tried to show that she can also do the same with the ubiquitous network.

4 Conclusion

So let us summarize again. I have tried to show in the previous section that the self distributed over the network does not have to imply that our cherished notions of freedom and autonomy have to be jeopardized. I have also shown that the idea of there being more than one distributed selves connected to a ubiquitous computing network means that the selves who are connected in this way are in a much better position to connect to one another. In a way, the selves will be physically connected with one another; instead of having to imagine what it would be like to be in another's shoes, one can literally feel what others are feeling without having to imagine it because the information pertaining to everyone's bodily conditions will be able to travel around the network. As Baron-Cohen has shown (2011), empathy is very much connected with compassion and the lack of cruelty in humans. Empathetic people are much less likely to commit cruel acts than those who are less so, and those who do bad things typically are less empathetic. Exceptions are only those with conditions such as autism or asperity syndrome, which prevent them from having adequate empathy, but still they won't commit cruel acts either (Baron-Cohen 2011). Empathy is the ability to feel and think what others feel and think. With the distributed selves across the network, empathy will be a result not only of imagination but of the physical network itself.

So what do all these imply for being a human being in this technology-saturated age such as ours? It is quite certain that the notion of what is a human being that has been in operation throughout history needs to change. Many research from different academic fields concur that the idea of the inherently existing self, one that presides over the body and functions as the referent of each use of the first-person pronoun, exists only as a result of kind of orientation, to use Damasio's term. When the orientation changes its course, then this type of self no longer exists. Hence, this kind of self does exist in the same way as

latitudes and longitudes exist on the geographical field: They don't exist in themselves, but they do exist as a result of our map-making and drawing coordinates on the map. The self thus exists also in Searle's sense of "social reality," which gives certain monetary value to a valid bank note (Searle 1997). A note is valued, say, at 20 British pounds simply due to the fact that it was issued by the Bank of England and passes as a legal tender. Physically speaking, the note itself is nothing but a sheet of paper. In the same vein, the putative self passes as a self, that is, a referent of the first-person pronoun, not in virtue of its possessing the absolute quality of being a self, but by being taken up and agreed by all concerned to function in this way. Hence, the self, in Searle's language, is also a part of social reality. What I have added in this paper is that this kind of social, relational self is also found in the distributed network enabled by ubiquitous or pervasive computing technologies. Vastly different philosophical traditions such as Buddhism and the thought of Spinoza concur in maintaining that the idea of an inherently existing self is not tenable.

Acknowledgments Research for this paper has been supported in part by grants from the Thailand Research Fund, grant no. BRG5380009, and from the National Research University Project, grant no. HS1025A and AS569A. I also would like to thank the anonymous referees of this paper, whose comments and criticisms led to many improvements of the paper and corrections of many mistakes.

References

- Baron-Cohen S (2011) *The science of evil: on empathy and the origins of cruelty*. Basic Books, New York, NY
- Blackmore S (1999) *The meme machine*. Oxford University Press, Oxford
- Blackmore S (2003) Consciousness in meme machines. *J Conscious Studies* 10:19–30
- Bruner J (1990) *Acts of meaning*. Harvard University Press, Cambridge, MA
- Collins S (1982) *Selfless persons: imagery and thought in Theravada Buddhism*. Cambridge University Press, Cambridge, MA
- Damasio A (2003) *Looking for Spinoza: joy, sorrow and the feeling brain*. Houghton Mifflin Harcourt, New York, NY
- Dan Z (2007) Expression and empathy. In: Hutto D, Ratcliffe M (eds) *Folk psychology reassessed*. Springer, Berlin, pp 25–40
- Dawkins R (2006) *The selfish gene: 30th anniversary edition—with a new introduction by the author*. Oxford University Press, Oxford
- Floridi L (2011a) *The philosophy of information*. Oxford University Press, Oxford
- Floridi L (2011b) The construction of personal identities online. *Minds Machines* 21(4):477–479
- Floridi L (2011c) The informational nature of personal identity. *Minds Machines* 21(4):549–566
- Gergen KJ (1991) *The saturated self: dilemmas of identity in contemporary life*. Basic Books
- Gergen KJ (1994) Exploring the postmodern: perils or potentials? *Am Psychol* 49(5):412–416
- Hongladarom S (2007) Analysis and justification of privacy from a Buddhist perspective. In: Hongladarom S, Ess C (eds) *Information technology ethics: cultural perspectives*. IGI Global, Hershey, PA, pp 108–122
- Hongladarom S (2011a) Personal identity and the self in the online and offline world. *Minds Machines*. Available online at <http://dx.doi.org/10.1007/s11023-011-9255-x>
- Hongladarom S (2011b) Pervasive computing, privacy and distribution of the self. *Information* 2(2), 360–371. Available at <http://www.mdpi.com/2078-2489/2/2/360/>
- Lynch Aaron (1996) *Thought contagion: how belief spreads through society*. Basic Books, New York, NY
- Manzotti R (ed) (2011) *Situated aesthetics: art beyond the skin*. Imprint Academic
- Nadler S (2006) *Spinoza's ethics: an introduction*. Cambridge University Press, Cambridge, MA
- National Institute of Standards and Technologies (NIST) (2001) About pervasive computing. Available from: http://www.nist.gov/pc2001/about_pervasive.html (retrieved 2 April 2005)
- Olson ET (2011) The extended self. *Minds Machines* 21(4):481–495
- Richardson J (2011) The changing meaning of privacy, identity and contemporary feminist philosophy. *Minds Machines* 21(4): 517–532
- Searle J (1997) *The construction of social reality*. Free Press, New York, NY
- Shotter J (1993) *The cultural politics of everyday life*. Open University Press, Buckingham
- Siderits M (2003) *Personal identity and Buddhist philosophy: empty persons*. Ashgate, Aldershot
- Siderits M (2007) *Buddhism as philosophy: an introduction*. Ashgate, Aldershot
- Siderits M (2011) Buddhist non-self: the no owner's manual. In: Gallagher S (ed) *Oxford handbook of the self*. Oxford University Press, Oxford, pp 297–315
- Spinoza B (1985) *The collected works of Spinoza*. (transl Edwin C) (ed) Princeton, NJ, Princeton University Press
- Stanton Wortham (1999) The heterogeneously distributed self. *J Construct Psychol* 12:153–172
- Stevens R (1996) *Understanding the self*. Sage Publication, London
- Ward D (2011) Personal identity, agency and the multiplicity thesis. *Mind Mach* 21(4):497–515
- Weiser M (1991) The computer for the 21st century. *Sci Am* 265(3):94–104
- Weiser M (1993a) Ubiquitous computing. *Computer* 26(10):71–72
- Weiser M (1993b) Some computer science issues in ubiquitous computing. *Commun ACM* 36(7):75–84
- Zahavi Dan (2009) Is the self a social construct? *Inquiry* 52(6): 551–573
- Zahavi Dan (2011) Unity of consciousness and the problem of self. In: Gallagher S (ed) *Oxford handbook of the self*. Oxford University Press, Oxford, pp 314–333