Ethics Inf Technol (2010) 12:71–85
DOI 10.1007/s10676-009-9215-9

ORIGINAL PAPER

Identity, profiling algorithms and a world of ambient intelligence

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Published online: 21 January 2010

Abstract The tendency towards an increasing integration of the informational web into our daily physical world (in particular in so-called *Ambient Intelligent* technologies which combine ideas derived from the field of Ubiquitous Computing, Intelligent User Interfaces and Ubiquitous Communication) is likely to make the development of successful profiling and personalization algorithms, like the ones currently used by internet companies such as *Amazon*, even more important than it is today. I argue that the way in which we experience ourselves necessarily goes through a moment of technical mediation. Because of this algorithmic profiling that thrives on continuous reconfiguration of identification should not be understood as a supplementary process which maps a pre-established identity that exists independently from the profiling practice. In order to clarify how the experience of one's identity can become affected by such machine-profiling a theoretical exploration of identity is made (including Agamben's understanding of an *apparatus*, Ricoeur's distinction between *idem*- and *ipse*-identity, and Stiegler's notion of a conjunctive–disjunctive relationship towards *retentional apparatuses*). Although it is clear that no specific predictions about the impact of Ambient Intelligent technologies can be made without taking more particulars into account, the theoretical concepts are used to describe three general scenarios about the way wherein the experience of identity might become affected. To conclude, I argue that the experience of one's identity may affect whether the cases of unwarranted discrimination resulting from ubiquitous differentiations and identifications within an Ambient Intelligent environment, will become a matter of societal concern.

Keywords Ambient Intelligence · Apparatus · Collaborative filtering · Discrimination · *Idem*- and *ipse*- identity · Personalization · Profiling algorithms · Recommender systems · Paul Ricoeur · Bernard Stiegler

In cyberspace identification has become an important and ubiquitous practice. This is evident not only in the unique identification that takes place through passwords, user-ID's and IP-addresses, but also in the categorical identification (i.e., classification) through continuously reconfigured user-profiles on sites like *Amazon*. The current developments within the field of Ambient Intelligent[1] technologies, which lead increasingly to the integration of the informational web into our daily physical world, are likely to grant even more importance to such profiling practices. I argue that such algorithmic profiling[2] should not be understood as a supplementary process which maps a pre-established identity that exists independently from the profiling practice, but that the way in which we experience ourselves

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[1] A vision wherein Ubiquitous Computing (i.e., embedded computational intelligence in a multitude of day-to-day objects), Intelligent User Interfaces and Ubiquitous Communication (to other intelligent devices) create an environment which anticipates and interacts with users. See further: "Identity in a world of profiling algorithms and ambient intelligence".

[2] Algorithms that are used to build user profiles, based on their ability to detect interesting correlations and patterns in implicit (e.g. browsing history) and explicit (address, age, etc.) user data. See further: "Identity in a world of profiling algorithms and ambient intelligence".

necessarily goes through a moment of technical mediation. This argument leads us to the question *how* the experience of one's identity can become affected by such ubiquitously present and continuously reconfiguring identifications. In this paper, which is divided into four sections, I will attempt to give several preliminary answers to this question. However, before turning to these preliminary answers ("Three ways in which ubiquitous profiling algorithms could affect identity") and the societal concerns which follow from them ("Some concluding thoughts on the discriminatory power of algorithmically constructed shibboleths"), it will be necessary to make some terminological clarifications. Therefore, I will first take a closer look at the complex philosophical concept of 'personal identity' ("Identity apparatuses, *idem* and *ipse*, and a conjunctive–disjunctive relation towards retentional apparatuses") and at two interrelated technical notions—profiling algorithms and Ambient Intelligence ("Identity in a world of profiling algorithms and ambient intelligence").

Identity apparatuses, *idem* and *ipse*, and a conjunctive–disjunctive relation towards retentional apparatuses.

Writing about identity is a theoretical minefield. As more or less every imaginable position on the notion of personal identity will be considered a simple truism by some and a highly contestable proposition by others, I will begin by making two caveats about the theoretical exercise which I will undertake in this section. The first warning is that I do not aspire to give an exhaustive account of the topic[3] but merely some conceptual distinctions which are productive tools in answering the question posed in this particular paper: i.e., in which terms can one discuss how certain new informational technologies will affect the experience of one's self? However, the second caveat is that such a pragmatic approach does not imply conceptual crudeness. Thus, even though one could summarize my theoretical understanding of personal identity as a relational phenomenon (after all, it is obvious that in a *horror vacui* a husband is not a husband, a friend is not a friend and a Frenchman is not a Frenchman!) which can both be experienced as a static *what I am* and as a temporal-existential *who I am*, such a blunt outline lacks the necessary conceptual precision. In order to discuss the complex relation between information technology and the experience of one's identity I will therefore introduce the notions of the *apparatus* (in accordance with Agamben's reading of Foucault), *idem* and *ipse* (Ricoeur) and a *conjunctive–disjunctive relationship towards retentional apparatuses* (Stiegler). The rather basic constructivist and processual understanding of identity (identity emerging from *apparatuses*) which is presented in the first step is complicated with an existential dimension in the second step (identity is not merely *idem* but also *ipse*). In the third step this existential dimension is studied more closely by focusing on how *idem* and *ipse* arise from a process wherein a living being enters a conjunctive–disjunctive relation towards experiences which are not one's own (*retentional apparatus*). Though these philosophical notions might at first sight seem to add unnecessary complexities to the issues at stake, on second sight their theoretical complexity will turn out to be indispensible in determining more precisely which phenomena constitute identity and to avoid staying trapped in some conceptual oppositions (e.g., 'cultural vs. material' and 'social vs. technical') which are often taken for granted too easily.

Step 1. Identity apparatuses (Agamben's Foucault)

One of Foucault's major insights (see e.g., Foucault 1977, 1985) was that subjects and their sense of identity[4] are not naturally given substances but that they are constituted through apparatuses (*dispositifs*), i.e., that subjectivisation (*assujetissement*) arises from systemic concatenations of knowledge, practices, architectures, techniques, etc.:

> […] '*assujetissement*' […] is a term which covers how the individual is 'subjectified' in relation to forms of knowledge and discourse, 'subjected' in technologies of domination, and 'subjectifies' him or herself in relation to rules and techniques of ethical conduct. This triple fabrication of the subject is thus not simply an effect of domination but a complex result of practices and techniques of power, knowledge, and ethics. (Dean 1994, pp. 112–113)

It should be noted that such processes of *subjectivisation* should not be confused with simple *subjection*:[5] an identity

[3] Thus I have chosen not to discuss some of the leading works in this field such as Erving Goffman's *The Presentation of Self in Everyday Life* (1956), Frantz Fanon's *Black skin, white masks* (1967), Charles Taylor's *Sources of the Self. The Making of Modern Identity* (1989), Anthony Giddens' *Modernity and Self-Identity* (1991) and Judith Butler's *Giving an account of oneself* (2005), even though some of the ideas presented in these works (e.g., Butler's understanding of performative identity) do tie in quite well with the notion of identity and the identification practices such as they are presented in this paper.

[4] Foucault hardly ever used the notion identity because he considered it to be too static. Instead he preferred to talk about the subject and the self, while stressing the necessity of considering one's self as a creative process of becoming (see e.g., Foucault 1996; Sawicki 1994).

[5] Foucault even argues that discipline is a *necessary* condition to individual freedom: "Clearly one could not liberate individuals without domesticating (*dresser*) them" (Foucault 2001, p. 911, transl. KdV). For a more detailed discussion on how the restraints of an apparatus actually *allow* for the creation of one's self: Foucault (1988) and Sloterdijk (2009).

(e.g., a Western heterosexual middle class female) arising from apparatuses of subjectivisation (*dispositifs d'assujetissement*) does not determine one's actions, but it does structure the field of possible behavior. This Foucauldian idea has had a large methodological impact on identity research (see e.g., Benwell and Stokoe 2006; Hekman 2004). Instead of considering identity as a substance which can be excavated from interior depths many researchers have turned their investigations to the operational spaces which produce particular subjectivities such as, for instance, that of a penitent prisoner, a schoolchild, a mentally insane, a foreigner, a consumer, a husband, etc. Thus, following this constructivist and non-essentialist approach to identity, studying the impact of new information technologies on the experience of one's identity would involve drawing up an inventory of the apparatuses (*dispositifs*) which constitute these technologies. Two aspects of this methodological instruction need some further clarification. Firstly, there is the word *apparatus*—even though alluring, it is also difficult to define what it exactly encompasses (see e.g., Agamben 2009; Deleuze 1992; Foucault 1980, pp. 194–196). One of the strengths of the notion is that it enables one to think beyond oppositions such as 'cultural vs. material', 'social vs. technical' or 'organic vs. inorganic'. An apparatus[6] is a constellation or a practice—which can consist out of both 'social' techniques and 'technological' devices!—that orients our experiences and perceptions. Thus, we ourselves can be apparatuses as well:

> The literal reader is him- or herself an apparatus—is 'apparatused': reaching from the self to the contents of a literal recording is conditioned on having spent many years instrumentalizing, automating, mechanizing memory's operation, having been oneself and for oneself transformed into a reading instrument. (Stiegler 2009, p. 129)

Following Agamben (2009) one could say that Foucault's notion of the apparatus is both powerful and opaque—especially its relation to technology:

> I shall call an apparatus literally anything that has in some way the capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviors, opinions, or discourses of living beings. Not only, therefore, prisons, madhouses, the panopticon, schools, confession, factories, disciplines, judicial measures, and so forth (whose connection with power is in a certain sense evident), but also the pen, writing, literature, philosophy, agriculture, cigarettes, navigation, computers, cellular telephones and—why not—language itself, which is perhaps the most ancient of apparatuses—one in which thousands and thousands of years ago a primate inadvertently let himself be captured, probably without realizing the consequences that he was about to face. (Agamben 2009, p. 14)

With regard to the relationship between the notion of an apparatus and identity Agamben continues:

> …we have then two great classes: living beings (or substances) and apparatuses. And, between these two, a third class, subjects. I call a subject that which results from the relation and, so to speak, from the relentless fight between living beings and apparatuses. (Agamben 2009, p. 14)

Identities (i.e., subjectivities) are the relationships between living beings and apparatuses. This implies that *whenever* there is relationship between an apparatus and a living being, that the apparatus becomes an identity apparatus—e.g., a system of border control is as much an identity apparatus as a seemingly contingent political situation wherein distinct identities such as 'collaborators' and 'dissidents' emerge. Even when the apparatus is not put into place to produce identities it will nevertheless do so. A second troublesome aspect is that one could wonder whether the description of the operations of an apparatus fully coincides with the experience of a first person experience of the identity which arises from these operations. Or to put it differently—does talking in ontological terms about identity (my identity *is* who *I am*) add anything to a purely operational description (how does the identity apparatus *function* and what does it *produce*)? In order to answer this question I will take my recourse to Ricoeur's notions of *idem* and *ipse*.

Step 2. Idem- and ipse-identity (Ricoeur)

Notwithstanding its widespread use, the concept of identity suffers from several ambiguities. Firstly, identity denotes both a person's *uniqueness* as well as his or her similarity in relation to time or to others. This latter meaning is exemplified by the etymological Latin roots of the word 'identity', i.e., *idem* ("the same") and *identidem* ("time and again"; Groebner et al. 2007, pp. 26–27; Ricoeur 1994, p. 2 and 115 ff.). Although the modern notion of identity is etymologically related only to *idem*, its current meaning has become a conflation of *idem* with *selfhood*, i.e., the Latin term *ipse* (the 'self' or a 'person's uniqueness'). Secondly, personal identity is a creation both malleable, fluctuating and re-creatable (which might be expressed legally as "the freedom from unreasonable constraints on

[6] *Dispositif* is sometimes translated as 'social apparatus' in order to avoid the misconception that a *dispositif* is something purely mechanical or technical. For instance, see: Deleuze (1992).

the construction of one's own identity", Agre and Rotenberg 2001, p. 7) as well as stable and pre-established (e.g., "she finally discovered what she had always already been deep down inside—a dancer"). These two inner tensions coexisting within the idea of 'identity' ('selfhood vs. sameness' and 'malleable vs. pre-established') are delineated by Paul Ricoeur's distinction between *idem*-identity (*sameness* or *mêmeté*: *what* I am) and *ipse*-identity (*selfhood or ipseity*: *who* I am) as two different sides of personal identity.

First developed in the early 1990s by the philosopher Ricoeur (1994), the division between *ipse*- and *idem*-identity is an extremely powerful and radical philosophical gesture with regards to the philosophy of the subject. Not only did Ricoeur conceptually clarify many centuries of philosophy on human identity by reformulating them into two broad categories, but he also made a courageous attempt to *bridge* the two seemingly antonymous branches. The first group of theories adhere to what Ricoeur called the "exalted cogito", which assumes an autonomous, substantive, and genuinely free Cartesian cogito capable of moral self-determination. He further identified a contradictory tradition, labelled with the notion of the "humiliated subject" (e.g., Ricoeur 1994, pp. 11 and 16; 1998, p. 90). Foucault's and Agamben's non-essentialist concept of the *apparatus* clearly springs forth from this latter tradition—a tradition in which the idea of an autonomous subject was "shattered" (Ricoeur 1994, p. 11 ff.) by the anti-metaphysical hammer of philosophers such as Hume, Wittgenstein, Nietzsche and sociologists like G.H. Mead, Goffman, Giddens and Bauman. The group of thinkers united under the latter concept of the "humiliated subject" debunked identity as nothing more than a bundle of experiences, i.e., a grammatical habit of tying the sediment of cultural codes, identifications by others as 'such-and-such', technologies, social scripts, etc., to an illusory autonomous agency. *Idem*-identity is congruent with the ideas found within the realm of supporters of this 'shattered cogito'—it is the bundle of our experiences which emerge from the apparatuses that identify and mirror us as being the *same*: sameness in time (e.g., being the same as yesterday and anticipating being the same tomorrow as well) and sameness with others (e.g., being a typical Frenchman).[7] Whereas the notion of *idem*-identity is a rather straightforward object of study (there is a whole socio-psychological field of research into areas like stereotyping, discrimination, etc., studying the experiential effects of identifications and self-identifications through identifiers such as, e.g., one's identity card, character, genetic code and secret credit card code), *ipse*-identity is a more elusive topic. While it is important to underline the fact that Ricoeur does not propose there being a transcendental *ipse*-identity *outside idem*-identity, he does demonstrate how *idem*-identity gives rise to a more existential experience, one that he calls *ipse*-identity.[8] Thus, *ipse*-identity is nothing other than *idem*-identity, although experienced in a different way—as unique selfhood.

Let us slow down here for a little while: *unique selfhood*? Is Ricoeur still trapped by a spectral essentialist understanding of identity, unwilling to let go of the exalted Cartesian *cogito*? Contrary to the classical Cartesian cogito, both *idem* and *ipse* are neither primary nor direct experiences—Ricoeur denies the possibility that one might have immediate access to one's own '*I*'—but rather they are mediated through the experiential traces created by the identity apparatuses to which one is exposed. *Self*-understanding, according to Ricoeur, is never an "immediate intuition of the *I*" as it always involves mediation by a "long detour through objectification, making reflection an interminable Odyssey" (Ricoeur 2008, p. 143):

> Thus, why prefer *das Selbst* (the 'self' or 'oneself') over *das Ich* (the 'I')? […] In the first place, as is suggested by the grammar of numerous natural languages, the term *Selbst* is a reflexive form […]. Its reflexive character excludes the immediate intuition of the *I* and rather requires the long detour through objectifications […]. (Ricoeur 2008, pp. 143–142, transl. KdV)

Both *idem*- and *ipse*-identity are part of this mediated self. According to Ricoeur, however, this does not prevent us from distinguishing between *idem*- and *ipse*-identity in as far as *ipse* involves taking on *idem* (i.e., the experience of mediated sameness) *as one's own*:

> …sameness is the permanence of a person's fingerprints, or genetic code; on the psychological level, it is what is displayed as character—the word "character", moreover, is interesting, being the term used in printing to designate an invariable form. While the paradigm for ipse identity is, for me, making a promise. I shall hold firm, even if I change. (Ricoeur 1998, pp. 89–90)

Consequently, the question "Who am I?" cannot be reduced to the question "What am I?", even though it is only through *idem*-identity that one's *ipse*-identity is constituted. Nevertheless, the question is then: *who* is the one

[7] An *idem*-identity does not necessarily rely on a positive identification. Thus the dis-identification "I am *not* a typical Frenchmen", can also constitute one's *idem*.

[8] It is the profoundly existential dimension of Ricoeur's *ipse* which differentiates his distinction between *idem* and *ipse* from other non-essentialist but Janus-faced conceptualizations of identity (e.g., the *Me* and the *I* in Mead 1959; see further on Mead's distinction: Hildebrandt 2009).

to take up the *idem*-identity as one's own; *who* promises to hold firm? Are Ricoeur's *what* and *who* not merely an unnecessary redoubling of the same relational phenomenon? In the following I will argue that in order to understand *ipse*-identity in a way which is neither a transcendental Cartesian self, nor a superfluous redoubling of *idem*-identity, one has to clarify the difference in the experience of the temporal dimension in *idem*- and *ipse*-identity. Although Ricoeur himself wrote extensively on how the temporal dimension of the self could account for the promising character of *ipse*, he does not relate this to the question of technology, as has Bernard Stiegler for instance. This makes the philosophical analysis of the latter, in my opinion, more appropriate in relation to the possible changes arising from the functioning and experience of personal identity in a world of Ambient Intelligence, than Ricoeur's analysis which instead draws heavily upon literary and religious texts and which stays largely within a cognitive, reflexive (see e.g., the critique on Ricoeur's emphasis on theoretical reflection by Taminaux 2008, pp. 136–137) and ethical realm. Therefore, the following section makes a rather unorthodox attempt to distinguish the temporal dimension in Ricoeur's *idem*- and *ipse*-identities in relation to technology.

Step 3. Retentional apparatuses—how technological memory produces personal identity as a conjunctive disjunction (Stiegler)

In the previous section I discussed how Ricoeur's notion of *idem* can be understood as an assemblage of mediated experiences that are constituted by what goes *beyond* one's own life experiences. In order to be, for instance, an 'Asian homosexual Catholic' there needs to be a geopolitical, cultural and religious reality which allows one to experience one's sameness (*idem*) with these categorizations. Here, I argue that this 'mediating reality' is constituted by what Stiegler calls *technical memory*. As Stiegler points out, there are three different ways in which the past can be preserved: through genetic memory, somatic memory, and technical memory (Stiegler 1998, 2003, 2007a). The first kind of memory is present in every organism's DNA, whereas the second kind of memory is a way of inscribing experiences into an individual nervous system. Thus, for instance, the DNA of a dog is the genetic memorization of a long history of variation and selection endured by the dog's ancestors, whereas the occurrence of the salivation of Pavlov's dogs in response to the venerable physiologist's bell-ringing stimuli resulted from a somatic memory, i.e., a habit inscribed within their individual nervous systems. In addition to genetic and somatic memory, humans are also endowed with technical memory—a specific kind of memory which other beings largely seem to lack: "Humans die but their histories remain—this is the big difference between mankind and other life forms" (Stiegler 2003). Technical memory always requires support from a *retentional apparatus* (Stiegler 2010)—i.e., an apparatus which allows for information to be retained beyond the duration of an individual life. Thus, a retentional apparatus will always include a system of prosthetic memory-supports (e.g., a book, a person who has become 'apparatused' into literacy, a hard disk, or a memorial). Not only does technological memory *require* a technique or a technology which can transgress the limits of a somatic lifespan (e.g., by telling a story to somebody or by recording a song on a tape), but technological memory is also something which *emerges* together with techniques and technologies.

> […] a piece of pottery or a tool were not made to transmit any memory but they do so nevertheless, spontaneously. […] Other traces are specifically devoted to the transmission of memory: for example, writing, photography, phonography and cinematography. The latter even makes an industry out of producing and transmitting these traces we call retentions. It will be my claim that technics is always a memory aid. (Stiegler 2003)

An apparatus can be called *retentional* when it has the capacity to retain traces of a world which lies *beyond* our own lived experience. Such traces can be constitutive for who we are: in fact, an identity apparatus can only emerge when the apparatus has at least some retentional capacity. Yet, the fact that these traces are constitutive for our identity does not imply that their meaning is fully transparent to us. The 'immortal' and repeatable domain of cultural patterns, language structures, tools, practices, etc., always contains a "unique rest of ipseity" that is experienced "as *Unheimlichkeit*, uncanniness, not-being-at-home": *ipse* is the experience of one's *idem* as "only being *its* past, which is nevertheless not its own"[9] (Stiegler 1998, p. 218). Identity can therefore be understood as an 'and' while existing simultaneously as both *conjunctive* and *disjunctive* (Stiegler 2007b, p. iv); it is both uniting *and* separating, and opens up a plane wherein both the 'I' *and* the 'We' emerge at the same time; it is both *ipse*-identity (the disjunctive, finite 'and') and *idem*-identity (the conjunctive 'and', which relates oneself to an immortal realm of traces beyond one's own experience). *I* am an inheritor of a past (e.g., the Second World War, the French Revolution, Colonial History, but also the life of my grandfather, etc.), and in this sense this past is *mine*: "the dead seize the living" (Stiegler 2010) through a *conjunction* (*idem*) which takes place between me and this

[9] Stiegler (2009) does not use the notions *idem* and *ipse*, but speaks of the *what* and the *who*.

inherited retentional apparatus. Yet, at the same time this *conjunction* is also a *disjunction* (*ipse*) because *as an inheritor*, this past is *not my past*—I have not lived it. It is exactly this type of 'and', acting as both a conjunction as well as a disjunction—a "disjunctive conjunction" (Stiegler 2007b, p. xi.)—that makes it constitutive of *my* future via the possibilities I inherited from this past (Stiegler 1998, 2010). When the experience of identification and self-identification through one's facticity ("I and…") is accompanied by an experience of disjunctive conjunction ("I…"), self-identification becomes an act of appropriation: e.g., "I am a young woman—*given* the books I have read about Mary Wollstonecraft, Simone de Beauvoir, Cinderella and Snow White but *also given* the fact that my here-and-now is not theirs". Here the '*I*' is both constituted and dissolved within a '*We*'. Thus, every time the here-and-now forces me to reformulate who I am, I must do this in terms of an *idem*-identity that never completely covers who I am *right now*: "I am American (*idem*-identity)—this is an identity created by objects such as the songs I used to sing in primary school, my passport and the television series I watch—but what does it mean to be American *here and now* (*ipse*-identity)?"

> We will then think the past against the present and resist the latter, not in favour of a return but 'in favour, I hope, of a time to come' (Nietzsche), that is, by making the past active and present to the outside so that something new will finally come about, so that thinking, always, may reach thought. Thought thinks its own history (the past), but in order to free itself from what it thinks (the present) and be able finally to 'think otherwise' (the future). (Deleuze 2000, p. 107 and p. 119; referring to Foucault 1985, p. 9)

Each time *we*—or should I say *I*?—perform this seemingly simple act of going back and forth between 'I' and 'we', we traverse a whole range of retentional apparatuses. These socio-technological constellations of memorization and anticipation including calendars, alphabets, memorials, books, hammers, heuristics of memorization (e.g., Yates 2007), computers, houses, etc. constitute the 'and' in between a finite 'I' and an infinite 'we'.

From theoretical complexities to the practice of identifications

After giving a few examples of how identity is constituted and experienced, it is now time to return to *Ambient Intelligence*—the technological vision which instigated this theoretical exploration of identity in the first place. Before anything can be said about how identity is constituted and experienced in an Ambient Intelligent environment, we will first need to take a look at its *function* within this technological vision: what does it do and why is it needed? Only in the third section of this paper ("Three ways in which ubiquitous profiling algorithms could affect identity") will I come back to the question what implications such an Ambient Intelligent environment could have with regard to the conjunctive (*idem*) and disjunctive (*ipse*) experience of one's identity. However, first I will discuss the functioning of Ambient Intelligence *as an apparatus*. I will argue that in order for such an Ambient Intelligent constellation of techniques and technologies to function successfully, it is not so much the correctness as the *felicity* of an identification that is of crucial importance.

Identity in a world of profiling algorithms and ambient intelligence

The functionality of shibboleths generated by profiling algorithms

'Identity' is far from merely an existential and philosophical topic of reflection concerning oneself. Rather, it is a *shibboleth* (see e.g., Derrida 1992): a device used to decide who is in and who is out; who is us and who is them; who is likely to be a good customer and who is not; who is allowed to pass the border and who is not. Shibboleths are constituted by "every insignificant arbitrary mark […] as that difference becomes discriminative, decisive and divisive" (Derrida 1992, p. 404)—clothing, skin colour, tattoos and slang are just a few examples of the infinite amount of possible shibboleths.[10] One specific shibboleth-practice, which has been present since the late Middle Ages, is the use of *passaporta* and other informational credentials to regulate cross-border access (Groebner et al. 2007). In cyberspace, where information technology connects worlds and people that otherwise could never have any relation towards each other, the utilization of informational

[10] Of course, both the way wherein a shibboleth is constituted (does it rely on something one is born into, such as skin colour, or is it something you acquire later in life, such as a password or a tattoo?) and its implications (depending on the value attached to the categories between which the shibboleth discriminates) can influence to what extent the experience of one's identity will be affected by the categorization which emerges from the confrontation with the shibboleth. Though one should keep in mind there are no *essential* characteristics within a differentiating mark which determine the extent of the influence on one's *idem*-identity (a password is not *inherently* less important for one's *idem* than skin colour), the way wherein a differentiating mark comes about and the practical implications of the resulting classification, will influence the impact of the shibboleth on one's *idem*. I will return to this issue in section three, wherein the peculiarities of the constitution of statistical shibboleths within commercial practices will be discussed. In the present section, however, I limit myself to a discussion of the *functionality* of shibboleths within the Ambient Intelligent apparatus.

shibboleths (e.g., IP-addresses, credit card numbers and passwords) to regulate access has proliferated. However, next to this rather classical use of identifying credentials for purposes of inclusion and exclusion, the internet has seen the emergence of a new kind of informational shibboleth, one that functions as an indicator of differences to be commercially exploited.

> For each identification (the creation or cobbling together of identity) creates a figure that provides a material for its investment by the market. […] Black homosexuals, disabled Serbs, Catholic pedophiles, moderate Muslims, married priests, ecologist yuppies, the submissive unemployed, prematurely aged youth! Each time, a social image authorizes new products, specialized magazines, improved shopping malls, "free" radio stations, targeted advertising networks, and finally, heady "public debates" at peak viewing times. […] Capital demands a permanent creation of subjective and territorial identities […]. (Badiou 2003, pp. 10–11)

Although the segmentation of the market according to different consumer-identities and life-styles has been a widely accepted practice since the second half of the twentieth century (Rose 1999, pp. 85–86), this practice has reached a new level of sophistication in cyberspace. Thus, recommendation algorithms (Alag 2009; Linden et al. 2003) like those employed by *Amazon* make it possible to anticipate customers with customized offers (e.g., "*Customers with Similar Searches Purchased*:…") while targeted advertisements move beyond crude marketing categorizations into more subtle personalizations. Contrary to the seemingly unchangeable nature of a shibboleth, like that of a password or a passport, user-categorizations produced by algorithmic profiling software (e.g., Alag 2009; Custers 2004; Elmer 2004; Hildebrandt and Gutwirth 2008; Uchyigit and Ma 2008) have an interactive, adaptive and tractable nature. One of the powerful characteristics of algorithmic profiling software is that new information can be integrated within a malleable profile. When such profiling software is applied, one can create, for instance, recommender systems that are able to offer novelty within the range of the familiar—a capability most often generated by an ingenious algorithmic combination of data records of an individual user's past behaviour with those relating to past behaviour of similar users. Thus, the aggregated information of many users is assembled into a specific constellation to predict the likes and dislikes of one specific user (Barnet 2009; Sunstein 2007). The assumption underlying these so-called 'collaborative filtering' systems (Alag 2009; Linden et al. 2003; Shardanand and Maes 1995) is that people who once shared preferences in the past are also likely to share preferences in the future. Even though there are concerns that the permanent affirmation of one's preferences (Elmer 2004) might produce a radicalization of opinions and bring along adverse effects for democratic societies (Sunstein 2007), the use of information filtering systems continues to grow. Successful collaborative filtering systems have emerged in a vast range of areas such as music (e.g., *Last.fm* and *Pandora Radio*), movies (e.g., the *Internet Movie Database*), humour (e.g., *Jester*) and online search-engines (e.g., *iGoogle*).

Recently, the implementation of profiling algorithms within systems that anticipate their users—what Horvitz (2007, pp. 2–3) refers to as "intention and preference machines"—has slowly begun to move beyond the boundaries of the internet into the physical world. One example of the application of such a proactive system in the physical world is a car navigation system called *Predestination*, which is currently being developed by *Microsoft*. This navigation system can "deliver anticipatory notifications about traffic jams, alternate routes and interesting sights" (Krumm and Horvitz 2007, p. 105) based on destination probabilities calculated by a Bayesian algorithm using different aggregated data about driver behaviour (previous destinations, average driving time, the efficiency of the driver and geological and cartographic information). The need for algorithmically generated, categorical identifications is likely to become even more important in the following decades. The information flows of the internet will no longer be restricted to the relatively closed circuit of interconnected computers but will begin to animate 'smart' things. Such 'smart' things are ordinary objects (e.g., cars, hoovers, coffee machines, supermarket trolleys, etc.) that are enhanced with software and an interface, giving them a capacity to memorize and to interact with the world. Complete ambient spheres of intelligence might thus be created: e.g., a coffee machine that identifies you and anticipates how you would like to have your coffee. The success of this future apparatus—the so-called world of 'Ambient Intelligence' (see e.g., Weber et al. 2005; Wright et al. 2008) which at present merely remains a vision scattered on designer tables all over the world—will largely depend on the development of technology that is capable of effectively identifying and distinguishing between people.

Social technology—why Ambient Intelligence needs profiling algorithms

The concept of *Ambient Intelligence* is often used as a synonym for similar buzz-words like *Ubiquitous Computing* or the *Internet of Things*. However, Ambient Intelligence encompasses more than the latter two terms. Brey (2005) argues that Ambient Intelligence should be understood as a combination of Ubiquitous Computing,

Ubiquitous Communication and Intelligent User Interfaces. Ubiquitous Computing by itself refers to a vision in which computing is no longer restricted to a desktop computer characterised as "a world of its own" (Weiser 1991, p. 66), but a vision in which computing is brought into the world by integrating sensors and microprocessors with everyday objects. In comparison to Ubiquitous Computing, the model of Ambient Intelligence incorporates a certain additional *social* ability,[11] one relevant to both users (Intelligent User Interfaces) and to other devices (Ubiquitous Communication). The interconnectedness between Ambient Intelligent devices and their Intelligent User Interfaces could create a good niche for profiling algorithms: one might, for instance, imagine an Ambient Intelligent house (see e.g., Bieliková and Krajcovic 2001; Miller 2001; Vanhala 2001) in which the coffee machine identifies its user (Intelligent User Interface) and transmits the appropriate profile to the bathroom, having anticipated the individual's desire to shower in ~20 min time (Ubiquitous Communication). In such an environment a correct identification is of vital importance. It even seems obvious that it is *the* factor on which its success as a social technology depends.

However, which identification should be considered as 'correct' is far from evident. As every apparatus which generates an identification itself influences the constitution of one's identity, this 'correctness' cannot be found by simply comparing whether an identification corresponds to a 'true' identity. An alternative and pragmatic way of understanding 'correctness' would be to say that every identification by an apparatus which has a productive result is a felicitous one. Thus, what would count as a misidentification from a 'correspondence'-perspective could nevertheless be a felicitous identification from this pragmatic perspective. For instance, a system which by mistake addresses a child as an adult might be much more successful because the child likes the fact that it is being taken 'seriously'. Moreover, the child could even start to behave in a more adult-like way to comply with the expectations of the system. A nice example hereof is given by Mozer in describing his interactions with an adaptive home system. Mozer describes how he adapted his behavior towards the anticipations of the house: e.g., he would come home earlier than he would have done under ordinary circumstances as he felt that the house was 'expecting' him to be home by 8 pm:

> To the extent that the house discovers regularities of the inhabitants' behavior and inhabitants regularize their behavior to accommodate the house, the interaction converges on an ideal situation: inhabitants whose schedules and behavior are predictable, allowing ACHE [*Adaptive Control of Home Environments*] to both maximize comfort and minimize energy utilization. (Mozer 2005, p. 293)

The notion of a 'misidentification' is surrounded by the same definitional difficulties as a 'correct' identification. Looking at the research which has been done on communication in general, it turns out that miscommunications should not only be seen as something which is infelicitous. For instance, when miscommunication introduces humor and flexible openness to a situation, it can in fact be very productive and illuminating:

> Miscommunication is not plainly a defect or a mismatch: actually, it is also a *chance*, because it enhances the degrees of freedom available to the communicators in their interaction. (Anolli 2002, p. 4)

Thus a 'misidentification' can be both felicitous as well as infelicitous. In order to clarify the difference between a felicitous and an infelicitous identification, I present a scenario based on an Ambient Intelligent billboard (see Fig. 1) which is supposed to turn waiting at a bus-stop into a more agreeable and personalized experience. Whether an identification should be called infelicitous when the billboard fails to distinguish correctly between two 10-year-old school children (e.g., romantic light and background music) and an embracing young couple (e.g., projected commercials for children toys), depends on many factors. First of all it depends on what the billboard is supposed to do. If it is supposed to entertain, it actually might become more successful when it does make mistake sometimes: the comical situation and the entertaining process of finding out why this specific identification took place (e.g., "Was it the way you moved your body? Let's see what happens if we sit down in a different way") might turn an apparent misidentification into a very felicitous one. Secondly the felicity of an identification also depends on the interactivity

[11] In calling Ambient Intelligent appliances 'social technologies' two misapprehensions should be avoided. In the first place it should be underlined that I do not argue that, in contrast to the Ambient Intelligent versions, 'ordinary' technologies are a-social. Latour's famous example of the social imperative ("Leave the key at the desk") ventilated by attaching a heavy weight to hotel room keys, has successfully shown that the idea of a "divide between material infrastructure on the one hand and social superstructure on the other" (Latour 1991, p. 129) has to be abandoned. A second point to stress is that the additional social ability of Ambient Intelligent technology does not lie in the facilitation of social relations between people (such as can be found on, e.g., social network sites), but in the fact that it opens up the possibility of complex social relationships between users and devices. Whereas an ordinary fridge or coffee machine are characterized by indifferent and numb egalitarianism towards the world (i.e., the hotel key does not perceive any difference between visitors), a version of such domestic appliances which would be capable or differentiating between users could be described as much more 'socially' involved.

Fig. 1 Making Public Space Personal. *Photo Philips Homelab*. This picture constructed by *Philips* shows how in an Ambient Intelligent future people waiting at the bus-stop could be entertained with personalized information and advertisements

and learning ability of the system. Mistakes are not problematic as long as the system learns from them and as long as the identification can be overruled. While a mistake might be funny and productive the first time, it will become less so if it persists. Especially if the consequences are important for the user (e.g., a child is mistakenly charged to pay an adult fare in the bus) the possibility to correct the system becomes more important. However, it is important to keep in mind that social and personalized dimensions of Ambient Intelligent devices create a potential for socio-technical infelicities (e.g.: "My coffee machine does not understand me"), as well as felicities (e.g.: "My coffee machine is very funny and continues to surprise me"). Presenting a general typology to classify profiling algorithms according to their likelihood to produce felicitous and infelicitous identifications does not only go beyond the scope of this paper, but would also be difficult because of the requirements posed by different situations and appliances. Creating an appropriate profiling algorithm is a craft which can only be practiced with the specific application in mind. In any case it is clear that whether machine profiling with social purposes (for personalized interaction with its user) is felicitous or infelicitous, cannot be determined without taking into account factors such as the transparency of the algorithms, the goals which a device is supposed to achieve, the possibility to overrule the identification and the extent to which the system provokes anticipative conformity. While the assessment of the felicity of an algorithmically generated profile is a normatively complicated issue, I will focus in the following section on an issue which more or less precedes this normative debate. Before any normative appraisal of the functioning of an Ambient Intelligent system can be given it is necessary to make an inventory of the ways in which the profiles that these apparatuses thrive on could alter the possibilities of experience and the functioning of personal identity.

Three ways in which ubiquitous profiling algorithms could affect identity

In the first section of this paper I described identity as an experience arising from the use of technologies constituting a world of traces *beyond* the individual life with which one identifies. Keeping a diary, producing a home video, and acquiring literacy, as well as making use of Microsoft's *Predestination*, or the collaborative filtering algorithm of *Amazon* and *Last.fm*, are all activities which emerge from apparatuses that constitute a mediating reality that can give rise to identifications and identities. Identity is both an experience of sameness or *idem* ("I am an Asian homosexual non-Catholic") as well as an experience of the *ipse* or inadequacy of such identification ("What does it means to be an Asian homosexual non-Catholic in the here-and-now?"). It is important to note that in order to generate an *ipse* experience, one must first acquire an experience of *idem*: if I am not aware of being identified as a female—i.e., I am not aware of the distinction between male/female—the question asking what it means to be a woman *here and now*, will never arise. Or, to put it differently: when I experience my identity (*idem*) in terms like 'male' and 'homosexual', I could also notice that the apparatuses which enable me to have these experiences have their own existence which does not fully coincide with me because they are not experiences lived by me (*ipse*). One might argue that the lack of an *idem*-identity results in a kind of domino-effect: if one does not first identify with an *idem*-shibboleth, no existential *ipse* experience is possible. However, a very strong identification with one's *idem* can generate the illusion of complete transparency of and control over one's identity, thus obliterating any uncanny or existential experience of *ipse*. These observations regarding *idem* and *ipse* bring me back to the central question of the paper: how might the experience of one's identity be affected by the implementation of profiling algorithms within an Ambient Intelligent environment? I explore three tentative answers: (1) *There is nothing new under the sun*—identity has always been constituted by technological memory and is therefore, to a certain extent, opaque and beyond our control, (2) The complexity of profiling algorithms, the protean nature of the profiles they generate, and their seamless embedment within their environment all make it difficult to identify with one's *idem*-identity, thus consequently obliterating any experience of *ipse*, (3) The permanent confrontation with one's

identity is anticipated and produced through profiling algorithms—a *beyond* oneself—and gives further leeway to an uncanny experience of *ipse*.

Answer (1): There is nothing new under the sun

As convincingly argued by Stiegler, identity has always been comprised of technological memory and of prosthetic memory-supports. The source of one's identity inherently lies beyond oneself; thus it is clear that no transparent and intentionally controllable identity can exist. When one attempts to explain what it means to be 'an American', this may turn out to be as difficult a task as that of clarifying the effect of a highly complex profiling algorithm on one's identity. Stiegler convincingly shows how tools, objects and technologies have *always* been the mediating reality through which our identity is constituted. Therefore, one might also argue that one's technological environment has always been 'smart' and 'proactive'. One example lies in the realm of the supermarket. Not only does the pro-active trolley anticipate an individual's needs (e.g., "*Go to the left to find the best deal for the kind of coffee you like*"), but so do the old-fashioned supermarket shelves which 'assume' that the consumer has an average length, thus leading to the tendency to pick the products placed at eye-level. In a similar vein one might argue that the positioning of supermarket racks strongly 'suggests' to you which path to take—there are not many people who would choose to walk right over the check-out counter or jump into the fridge. Even so, there are clearly several differences between these two anticipatory technologies. Firstly, the pace at which old-fashioned shelves evolve and adapt themselves to the wishes and preferences of customers is much slower than that of a pro-active supermarket trolley. Secondly, the possibilities attributed to the means of differentiation made by the smart trolley are much more advanced and complex. Could this imply that there *is* something new under the sun after all? To answer this question I will take a closer look at the statistical nature of profiling algorithms, the complex and protean nature of the profiles, and the effects of seamless integration and interconnectedness of devices within an Ambient Intelligent environment.

Answer (2): The obliteration of the experience of one's identity

As demonstrated by the children's game in which one has to guess an assigned identity provided by a post-it note on the forehead ("Am I alive? Am I edible? Am I a woman?"), it is often difficult to deduce one's identity in a short period of time given few contextual clues. What makes one's predicament in this 'Guess Your Identity' game even more frustrating is the fact that the assigned identity is invisible only to that specific player and not to his or hers giggling fellow-players. One might argue that anticipations based on profiling algorithms could result in a situation akin to the 'Guess Your Identity' game: the act of anticipating an identity which has such a complex, protean, de-contextualized and hypothetical nature could lead to difficulty in experiencing an idem-identity; the difference generated by the shibboleth is opaque to the profiled user. Such *idem*-identity, although a workable construct for the interconnected social machines, is not available for experiencing oneself. There are at least four reasons why an algorithmically generated profile, functioning in an Ambient Intelligent environment, could lead to the bypassing of any self-identification constituting identity.

Statistical inference

In the identification of people as belonging to a certain category, i.e., 'profiling', inductive reasoning plays a crucial role. This involves both the assumption made regarding the sameness of different people (e.g., "Every blond girl I ever encountered in my life was stupid, thus I also expect this blond girl to be stupid") and the sameness in time ("For as long as I have known you, you have given me a negative impression—and I assume that you will be the same unpleasant character tomorrow"). Such 'inductive inference' or 'profiling' does not necessarily have any rational grounds and can lead to irrational stereotyping and discrimination. However, from a pragmatic point of view, it often proves an effective heuristic in order to cope with the world. In a way, the invention of statistical inference in the nineteenth century is a continuation of 'intuitive' profiling and there is no categorical difference between intuitive and statistical profiles as they can both generate felicitous as well as infelicitous identifications. However, the fact that statistical inferences are constituted in a probabilistic manner makes them more difficult to identify with. To clarify further, I will take a closer look at statistical inference.

Statistical inference relies on the logic that what remains incalculable on an *individual* level is nevertheless calculable on a *collective* level; e.g., although one might be unable to predict whether a particular person will get cancer, one can make a prediction about the percentage of people within the population likely to be afflicted by the disease (see, e.g., for diverse approaches to this topic: Ayres 2007; Custers 2004; Hacking 2004). Sometimes the statistical knowledge gained at the collective level is also used for the appraisal of individual cases: how likely it is that *your* lung cancer was caused by the asbestos exposure at *your* work, that *your* consumption and travel profile leads to *your* probable interest in buying product X or Y,

the statistical likelihood of *you* experiencing a heart-infarction within the next 10 years, the risk that *you* are not an innocent airplane passenger but a dangerous terrorist, etc. It is undeniable that these data technologies can be both felicitous to the user as well as the provider of a service. From the perspective of the provider a system of statistical identifications might be considered felicitous as long as they work *most of the time*. For the individual user they are felicitous as long as they generate a frictionless and user-friendly world adapted to his or her 'personal' preferences: for example, the insurance premium is exactly tailored to *your profile*, *Amazon* offers you the books that are very likely to appeal to *your personal taste*, etc. However, a tension can arise as statistical personalization techniques are not just about *you*—they also relate you to a virtual, probabilistic "community" or "crowd" in order to make a pragmatic judgement about you ("likely to be a terrorist", "person with a high risk of cancer", "probably not suffering from a sexual transmittable disease"). These probabilistic groupings do not necessarily correspond to human 'intuitive' stereotypes and may lead to forced groupings with which you feel no affiliation whatsoever: "What do *I* have to do with the 199 hypothetically similar people who are terrorists?" Thus, the issue which I want to highlight here is not that, in comparison to ordinary intuitive inferences, statistical reasoning would bring along an unacceptable amount of blunt probabilistic heuristics and discriminatory categorizations into society (see e.g., Gandy 2008), but the difficulty of relating one's identity to such probabilistic formulations. Whereas classical discrimination based on blunt and overt heuristics can lead to strong conjunctive identifications ("Yes, I am a heterosexual"), conjunctive dis-identifications ("I am identified as a heterosexual, but that is not what I am!") and disjunctive experiences towards the identification ("I characterize myself as a non-heterosexual, but at the same time I feel that such a label is an construction which is also alien to me, as it emerged independently from my individual here-and-now"), complex statistical categorizations may become lost due to their opaque nature. In essence, the notion of people entering into a "disjunctive conjunction" with such statistical shibboleths may not always be self-evident.

Outsourced anticipation

Ambient Intelligence technologies are currently still very basic. Yet, even the rudimentary ambient technology being developed today can provide insights into what to expect from more advanced technology in the future. One example of such a technology, which was conceived within the MIT Media Lab, translates the *Amazon* recommendation algorithm into an Ambient Intelligent environment:

> …technologies that make it possible for the book you are holding to tell you what passages you might be interested in, while the bookshelf in the room might show you which books are similar to the one in your hands …. (Maes 2005, p. 45)

One can imagine a world in which 'thinking ahead' is outsourced to a smart environment; for example, devices suggesting times and types of exercise work-outs (see e.g., Van Doorn et al. 2007), how to walk through the supermarket and what to buy (see e.g., Keegan et al. 2008), etc. How does this affect the manner in which we view ourselves? In the same way a calculator or a spell-checker tend to have a negative influence on one's basic arithmetic and linguistic skills, a technology that virtually makes forward-thinking unnecessary (e.g., "How much seed do I need to plant?", "Is it likely to be cold next week?", etc.) could weaken human openness to what is called the *idem/ipse*-entanglement or the conjunctive/disjunctive 'and'. When many of the day-to-day sources of anticipation are transferred to smart decision-making software, life becomes more convenient. However, this may once more lead to a diminished possibility for *idem*-identification, stemming from a certain laziness concerning one's own capacity to anticipate: after all, it is quite convenient to follow a recommendation. Nevertheless, taking into account Stiegler's notion of *retentional apparatus*, one could object that human anticipation has *never* belonged to oneself but has always relied on the 'suggestions' of one's surroundings.

The volatility of commercially productive differences

Recommendation algorithms often produce mobile, adaptive, and unarticulated categorizations—a classification should only be maintained as long as it is *productive*, and rather than act as a 'label' or a 'category', should be a mere algorithmic categorization. Moreover, the most productive recommendation machines perhaps involve a combination of different strategies used to predict someone's preferences: it attempts to combine inferences based upon the individual's past behaviour as well as the past behaviour of similar users with more substantive, structural and 'dictionary'-like information (cf. Alag 2009; Iskold 2008). One may wonder if customers who are treated differently according to real-time generated productive differences, i.e., differences that are only maintained as long as they are commercially lucrative, will be exposed long enough to self-identify with such categorizations. How does one identify oneself with protean and volatile classifications that are subject to a process of permanent real-time updating based on large amounts of available data? Or does the fact that a customer *acts* according to a suggestion already imply that self-identification has taken place?

Invisible embedment

What happens when airport personnel fail to identify an individual but smart technology systems do? What occurs when such a system identifies one as a potential terrorist but neglects to inform about the reasons for allowing/barring one's presence on a flight? Ambient Intelligence and Ubiquitous Computing thrive on the idea of invisible technologies, those that function silently on the outskirts of awareness, thus enabling greater focus on more interesting matters (Weiser and Brown 1998). When ubiquitously connected devices exchange data gathered in a disparate range of contexts, it becomes even harder[12] to infer the reasons behind anticipating something in a certain way.

In summary, it is clear that those profiling algorithms that work in an Ambient Intelligent environment generally fail to lead to clear cut self-identification with the categorizations to which one is subjected. Profiling algorithms are often based on opaque statistics, thus creating a certain anticipatory laziness, and often have a protean and volatile nature as well as the ability to be invisibly embedded in the environment. These are all factors that could contribute to an Ambient Intelligent predicament in which identifications rarely lead to the constitution of an *idem*-identity. In this manner, the assemblage of 'social', or Ambient Intelligent devices could exclude the user from the information taped to his or her forehead, knowledge otherwise privy only to the external players of the game. However, does this mean that the ubiquitously profiled inhabitant of an Ambient World will not experience any identity at all? Will profiling algorithms implemented in Ambient Intelligence make human identity drown in dynamic overarticulations to such an extent that human identity will in fact become less articulated? Will this bring the human way of being closer to a kind of pre-Neolithic, ephemeral-nomadic[13] experience? Although it seems unlikely that one will have no experience of identity at all (for example, in areas outside the scope of Ambient Intelligence one can develop all kinds of fine-grained identities (e.g., in inter-human relations)), one's identity may become more fuzzy and unarticulated in the domains dedicated to permanent anticipation generated by collaborative filtering algorithms. Even though certain aspects of one's identity may become more vaguely outlined, the creation of an *idem*-identity as an algorithmically anticipated user, consumer or citizen may also occur. An 'algorithmically anticipated person' could become an *idem*-identity suitable for self-identification (i.e., "I am an algorithmically anticipated person") or dis-identification (i.e., "I am not an algorithmically anticipated person"). This in itself could give rise to a specific kind of *ipse*-experience, the turning of one's attention to the uncanny notion that who one is, is always composed of something beyond one's self.

Answer (3): An uncanny confrontation with ipse: I am not myself

A strong identification with one's uncontested *idem* can generate the illusion of complete transparency and control over one's identity, thus obliterating any peculiar or existential experience of *ipse*. With time and habituation, one's *idem* can develop into a comfortable coat but a change in circumstances can instead undermine this: e.g., German identity in 1933 must have been less problematic than in 1946. Given its unobtrusive, unarticulated, embedded and invisible nature it is not very likely that an Ambient Intelligent environment would cause such a breakdown experience with regards to any identity in particular. Yet one interesting possibility is that it could change the *general* way in which identity construction is experienced. If one accepts Stiegler's argument that identity has always been constituted through technological memorization beyond one's own lived experience, the presence of an Ambient Intelligent environment could make this experience a more palpable reality. The fast adaptive pace attributed to profiling algorithms, their ubiquitous presence, and the overt use of behaviour of similar individuals in the anticipation, construction, and production of identities could all lead to an unusual thought: that one's identity is composed of, or at least mediated by, a technological reality beyond oneself. A series of rather counter-intuitive philosophical thoughts, including the mediated nature of one's identity (Ricoeur) and the technical nature of this mediation (Stiegler), suddenly turn into a plain and tangible experience. Even though one is characterised, but not governed by certain established technologies, not everyone will react in a similar way to a common predicament; it is exactly because of these technological collections that differences are produced! However, the possibility remains of giving rise to an existential keenness so overtly confronted with the production and exploitation of different identities. What has always been the case may suddenly become more conspicuous: "*I am not myself*", or as the

[12] Of course this not a categorical but a gradual difference with intuitive profiling.

[13] See Foucault's *Preface* to *Anti-Oedipus*: "Withdraw allegiance from the old categories of the Negative (law, limit, castration, lack, lacuna), which Western thought has so long held sacred as a form of power and an access to reality. Prefer what is positive and multiple, difference over uniformity, flows over unities, mobile arrangements over systems. Believe that what is productive is not sedentary but nomadic" (Foucault 2000, p. xii). See also McLuhan, who speaks of the inhabitants of the modern informational society as "nomads" (McLuhan 1964, p. 358), but who apparently interprets the concept in a manner different than my own understanding of the notion. He assumes that these nomads are deeply involved in the "total social process".

French poet Rimbaud famously said: "*I is an other*" ("Je est un autre").

Some concluding thoughts on the discriminatory power of algorithmically constructed shibboleths

How will the automated identification practices in an Ambient Intelligent environment affect the experience of one's identity? As with all equally interesting and complex questions, there is no unequivocal answer. To a certain extent there is nothing new under the sun: Ambient Intelligent technologies can be considered as a continuation of previous technologies (*answer 1*). However, ubiquitous anticipation by profiling algorithms could lead to greater difficulty in articulating certain aspects of one's identity (*answer 2*) or even initiate an existential conjecture concerning the opacity and uncontrollability of one's identity in general (*answer 3*). Moreover, one might question whether the difference between classical shibboleths of inclusion/exclusion (e.g., "People without a European passport are not allowed to pass this border") is in fact different from the algorithmically constructed shibboleths (e.g., "If one's algorithmically constructed rating is higher than 55, then one is strongly advised to go to the third floor of the library since one is most likely to find one's relevant preferences there"). Technologies *always* differentiate between and discriminate against people (e.g., ordinary supermarket shelves discriminate against short people). Yet, what makes discrimination by an ambient concatenation of algorithmic identifications different is the fine-grained and adaptive spectrum of categorizations that it can produce. This brings me back to the normative questions of the felicity or infelicity of a categorization. As I argued earlier ("Identity in a world of profiling algorithms and ambient intelligence") a seemingly 'correct' identification might nevertheless be very infelicitous from a normative perspective. For example, a large range of different categorizations, or even 'personalizations', creates the illusion that staying in one's own category is always the best option, i.e., that one is constantly and correctly 'understood' by the Ambient Intelligent device. Yet, in the vast range of available options, not every category remains a positive place (e.g., the third floor of the library might be the floor with all the outdated and uninteresting books, to which all the 'intellectually hopeless and potentially noisy people' are sent). When relying on machine profiling one always will have to be wary of infelicitous and unwarranted discrimination, as profiling practices are "designed to facilitate the identification and classification of individuals into distinct groups or segments" (Gandy 2002, p. 11). In addition, the fact that machine profiling is technologically and bureaucratically institutionalised ("the machine does not make mistakes") can make it a more difficult opponent against which to fight and to argue than 'classical' human discrimination (cf. Steinbock 2005; Zarsky 2002–2003). Moreover, the increased use of machine profiling could possibly lead to a serious increase in unwarranted discrimination in general. A growing use of profiling would automatically increase the amount of faulty categorizations (Van Bendegem 2008) while certain commercially profitable categorizations might find themselves at odds with what is perceived as legitimate discrimination in a constitutional democracy. It is important to bear in mind that a statistically significant difference is not enough to legitimise a discriminatory practice; for instance, there may be constitutional reasons to ignore a difference. On a more positive note, in some cases profiling could be a helpful tool in debunking persistent, unwarranted categorizations haunting human profiling (e.g., "There was no significant difference found in the databases between the grades of blondes and brunettes").

In light of the fact that automated identification practices in an Ambient Intelligent environment are likely to open up a whole new range of grounds for discrimination, further academic and societal debates are needed to decide which forms of discrimination are warranted and which are not. In such debates, the experience of identity might play an important role. When something goes unnoticed and is unarticulated, it does not easily become a matter of concern. For example, an individual who is only vaguely aware of the kind of profiling practices to which he or she is being subjected, is unlikely to become concerned about his or her predicament. However, the more knowledge one gains regarding one's identity (far from being an autonomous Cartesian subject) and of the dangers posed to it by economic exploitation, the greater the opportunities become for beginning a constructive debate regarding the types of discriminatory devices (*shibboleths*) allowed in a constitutional democracy.

Acknowledgments Parts of this text build on FIDIS deliverable 7.14a, especially on Chaps. 3 and 5 (forthcoming at http://www.fidis.net). I thank Sebastian Abrahamsson (Oxford University), Niels van Dijk (Vrije Universiteit Brussel), Mireille Hildebrandt (Vrije Universiteit Brussel), Bernhard Irrgang (Technische Universität Dresden), Jannis Kallinikos (London School of Economics), Bert-Jaap Koops (Universiteit van Tilburg), Arun Tripathi (Technische Universität Dresden), Jennifer Schofield (Oxford University) and the three anonymous reviewers for their salient comments.

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