*CoDesign*
Vol. 6, No. 4, December 2010, 187–206

Taylor & Francis
Taylor & Francis Group

# Designing empowering and critical identities in social computing and gaming

D. Fox Harrell*

*Comparative Media Studies Program, Program in Writing and Humanistic Studies, Computer Science and Artificial Intelligence Lab (CSAIL), Massachusetts Institute of Technology, Cambridge, MA, USA*

(*Received 16 June 2010; final version received 27 September 2010*)



This article presents theory and technology addressing the design of computing technologies for social computing and gaming: (1) to provide dynamic means of identity representation while avoiding stigmatising norms, and (2) to provide for critical reflection on stigmatising identity infrastructures found in other systems. The theory and technologies developed with these aims are encapsulated under the rubric of the Advanced Identity Representation (AIR) Project that initiated in the Imagination, Computation, and Expression Laboratory (ICE Lab) directed by the author. This work has a basis in the cognitive science foundations of categorisation and metaphor-based bias, and study of social classification infrastructures from sociology of science. Using this theoretical framework, this article provides a model to reveal a set of inadequacies of many current identity infrastructures in social computing and gaming systems for supporting the needs of collective groups of people and individuals in marginalised categories. As results, several social networking systems and games developed in the ICE Lab to empower users in the creative goal of constructing computational identities and/or critiquing the phenomenon of stigma in these applications are presented.

**Keywords:** stigma; social identity; cognitive categorisation; social classification; empowerment; gaming; social networking

## 1. Introduction

Social computing and identity representation technologies such as social networking sites, profiles/accounts in commercial retail sites, and many computer/video games allow users to interact with one another and to create virtual personae for themselves in unprecedented ways. Cumulatively, self-representation in social computing systems comprises a type of collective creativity. Indeed, a self-representations become types of improvised digital prosthetic devices that enables virtual actions that may not be possible in the real world, yet are natural to virtual environments (immediately knowing when a friend logs in, asking a remotely located administrator for help upon encountering a glitch). Users have deployed these digital identities in a range of astounding ways suited to their needs ranging from speakers at virtual

*Email: fox.harrell@mit.edu

ISSN 1571-0882 print/ISSN 1745-3755 online

DOI: 10.1080/15710882.2010.533183
http://www.informaworld.com

conferences to avatars in virtual performance art, much the same as people might create physical prosthetic devices out of necessity to accomplish everyday tasks in the real world. (Barros and Duarte 2009). Yet, it has become clear that many current technologies are limited in how they enable creative exploration and understanding of identities other than one's own – an early utopian dream regarding networked digital media. This article asks what it would take to design technologies that take up that dream as a goal, along with sobering reflection upon the difficulties of that challenge. Indeed, part of the challenge is to look at ways that current computational identity technologies are disempowering and to differentiate between the goals of (1) open-ended ability to create distinct and nuanced self-representations (both visually and in terms of back-end information), and (2) the possibility that user-representations can have transformative conceptual impact on how users view themselves and the social identities of others.

In the real world, humans have the ability to creatively present ourselves in fluidly nuanced and dynamic ways, seamlessly varying gesture patterns, discourse structures, posture, fashion, and more, often with an astounding sensitivity for context. We are also often quite aware of the perceived appropriateness of particular ways to present one's self in different situations, as well as social avenues that may be closed off or accessed only with more difficulty due to externally defined social prejudices and biases. The perceived negative difference between diverse individuals and socially defined, desirable and privileged norms is called stigma. Some forms of stigma are necessary, inhibiting crime or behaviours that are universally seen as socially detrimental, yet other forms of stigma comprise unfounded prejudices, biases, and inequities that underlie a great deal of social conflict. It is important to consider how these forms of stigma and related disempowering phenomena exist in social computing and gaming technologies. Furthermore, we can develop such technologies to provide complementary forms of self-presentation that can be empowering and/or enhance critically awareness.

Elaborating insights offered in Harrell (2009), this article suggests several ways that cognitive science and computing can contribute to both the empowerment of individuals and the understanding of disempowering social infrastructures, particularly regarding social networking and gaming. The Advanced Identity Representation (AIR) Project seeks to enable more creative and empowering forms of social identity representation in computing applications. Toward this end, this article introduces new theory, new technologies, and new design considerations. It is structured as follows: presented first is a motivating discussion and summary of multiple ways in which current technologies are inadequate in the face of the creativity with which humans present themselves outside of digital media. This account is then followed by a novel interdisciplinary theoretical framework, which has been developed under the rubric of the AIR Project (Harrell *et al*. 2009). This framework provides a basis for developing an approach to computational identity relevant across various types of social computing systems. The analyses here are centrally based on accounts of categorisation from cognitive science, and social classification infrastructures from sociology of science. Building upon these accounts, an overview of the phenomenon of stigmatised identity as raised in sociology is provided that may be useful for orienting readers unacquainted with this literature.

Analyses are presented of one game developed in the ICE Lab called *Chameleonia*, and two social networking projects developed in the ICE Lab called

*DefineMe* and *IdentityShare* (the latter is an MS student's thesis project) as providing new infrastructures to critique stigma and to provide more dynamic and empowering modes for users to represent themselves and form communities (Harrell *et al*. 2009). The implications of such systems for new design strategies and considerations follows. Finally, a concluding section provides reflection on the paper's argument, describes a framework for evaluation, and highlights future challenges.

## 2. Problems with current technologies

Let us begin with an illustrative example. Consider that popular current games such as the *Elder Scrolls IV: Oblivion* and *World of Warcraft* computationally implement and amplify many disempowering existing social identity constructions. In *Oblivion*, females of some races are 10 points more intelligent than their male counterparts, and individuals of the ostensibly French 'race' (Bretons) are 20 points more intelligent than their ostensibly Norwegian (Nords) counterparts, regardless of gender (Blizzard 2005, Bethesda 2006). A starting point for the issue here is that distinctions of ability are mapped on to categories that nearly duplicate real-world stigmatising prejudice. More profoundly, these distinctions are not only visual, semiotic ones; instead, they have instrumental effects on gameplay. Recalling social scientists and cultural theorists Geoffrey Bowker and Susan Leigh Star claims that 'classification systems are integral to any working infrastructure' and 'systems of classification form a juncture of social organisation, moral order, and layers of technical integration' (Bowker and Star 1999), I argue that stigma is built into the game's infrastructure for character creation. The characters resemble members of real-world identity categories and the character ability statistics echo real-world prejudices, yet the effects of the statistic are implemented through algorithmic means that regulate the player's instrumental goal of playing the game.

A broader argument can be made that extends across platforms, as I have argued in Harrell (2010). Current infrastructures for computational identity representation are limited in significant ways. They enable users to present themselves through social networking profiles, offering the information about themselves that they want others to know, although often forced to fit it into predetermined data structures and interfaces. They create avatars to participate in communities in virtual environments, although the way they customise our identities is often accomplished just through sliders and menu-driven options, not on what users actually do in these environments. The following summarise some high-level insights regarding current social computing and gaming systems.

### *2.1. Online social networking*

Social networking systems exhibit characteristics such as:

- user categories are predefined (e.g. birth date, gender, or relationship status);
- social data structures are hierarchically organised (e.g. tiers such as forum moderators, registered participants, and guests);
- simplistic models of community membership are used (e.g. opt-in/opt-out friendship or group affiliation models);

- identity is only individually defined (e.g. creating a profile webpage with no facility for input from others);
- there is no facility to mediate between communities (e.g. sites where groups can post messages to members, but not to other related groups); and
- their uses are informational rather than imaginative (e.g. users update each other about everyday life or network for professional reasons, but sites for sharing creative endeavours are more rare).

### *2.2. Gaming and virtual worlds*

Computer and video games often exhibit the following characteristics:

- attributes are reduced to numerical statistics (e.g. values for hit points, intelligence, charisma, etc., in role-playing games);
- social categories are reduced to graphical models and skins plus numerical statistics (e.g. avatars in most computer role-playing games and virtual worlds); and
- character changes and narrative progress in many popular genres of computer and video gaming are often driven primarily by: combat, spatial exploration, and object acquisition (e.g. in most massively multiplayer online role-playing games and many action adventure games).



### *2.3. Implications of current problems*

The lists are not meant to be exhaustive or mutually exclusive. Rather, they are meant to illustrate the argument that stigmatising and socially constrictive phenomena can be implicitly hardcoded into social computing systems. The problem with these characteristics is that they offer limited affordances for designers to model real-world social identity phenomena and limited affordances for users to express some of the nuances of real-world self-expression. Certainly many of these characteristics serve useful purposes – e.g. player characters in role-playing games are structured to serve game mechanical needs – offering balanced and diverse play styles for completing quests. Yet, these needs are often conflated with real-world categories such as gender, race, class, profession, and more in ways that force stigmatising value systems onto users as in the *Oblivion* examples above. The aim in remedying this situation is not to create neutral and objective identity representation systems, or to allow for an endless number of customisation options; rather, it is to enable creation of highly contextualised and dynamic systems able to express specific, subjective social identity phenomena such as becoming a member of a community or adapting one's self-presentation to the particular other users present. In order to address these and other phenomena, engineers need to design infrastructures in a manner cognisant of the social phenomena that they intend to support or disallow. It is possible to develop more dynamic, robust, and creative technologies to expand the expressive potential of identity computing systems and to tailor them to particular communities of users, while avoiding the side effect of disempowering stigmatised and marginalised groups and individuals. Addressing these problems can provide greater customisability, make for more salient experiences, and invent new forms of expression and identity.

## 3. Theoretical framework

### *3.1. Shared technical underpinnings of computational identity*

The approach to computational identity articulated here is relevant across multiple forms of digital media. Various computational identity applications such as social networking sites, avatar creation systems for virtual worlds, and games are implemented using a limited and often overlapping set of techniques. Figure 1 describes, at a high level, the components that comprise the majority of widely used computational identity technologies (Harrell 2008). Fundamental to implementing computational identity applications, the six components in Figure 1 that commonly form the basis for avatar/character/profile construction can enable dynamic and contingent models of social identity in digital environments as described in Gee (2003) and elaborated in Harrell (2010).

There are two aspects of each of these components: (1) the front-end exhibited through graphics and their behaviours, and (2) the back-end implemented via algorithms and data structures. The boundary between data structure and infrastructure is blurred, because the character statistics comprise a (partially invisible) data underpinning for performed/enacted gameworld identities as regulated by procedural game mechanics, but also a platform for constructing a virtual self. For example, both a social networking page and a virtual world character screen both often contain subunits with flat text information such as descriptions or lists of preferences. They both contain a self-representation such as a profile picture or an avatar (the self's proxy for interacting in the gameworld). As design components, it is important to consider which aspects of socialising or gaming are encoded in each space both visually and procedurally, in light of real-world concerns for empowerment or critical awareness. Several important questions can be asked, including the following.

- Where is the computational identity focalised (e.g. is the nexus of interaction involving the character centred upon a graphical self-representation dependent upon algorithmically regulated affordances such as behavioural rules or

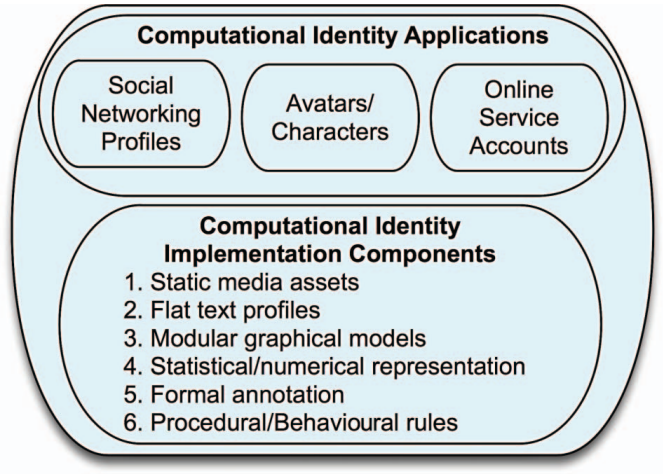


Figure 1. Shared technical underpinnings of computational identity applications.

through relatively open-ended systems less amenable to procedural regulation such as flat text files)?
- Which components of the computational identity are instrumental (i.e. impacting the effective use of representation in its domain) versus those that are cosmetic (i.e. expressions of user preference without functional implications)?
- What are the implications of instrumentally oriented decisions made in constructing the computational identity, do they reinforce potentially stigmatising norms (e.g. would choosing a female representation have any effect on abilities within a game)?
- What are the implications of cosmetically oriented decisions made in constructing the computational identity, can they impact instrumental functions negatively (e.g. would choosing a very large 3D representation result in negative impact upon gameplay due to blocking the in-game camera or other occlusion issues)?



Answering questions such as these are key to understanding how to create better designs that address the social and cultural implications of identity infrastructures and the representations built atop them. Understanding the reciprocities and overlaps between the technical means by which users stage their identities across digital media forms can enable more powerful customisability and cross-community communication facility in social identity systems.

In the design and software engineering of such systems, the reliance of computer scientists on intuitive understandings of identity, rather than nuanced theories that view identity as enacted, contextual, imaginative, and infrastructural, has resulted in software that at best ignores opportunities for empowerment, and at worst results in perpetuating longstanding social ills of discrimination and disenfranchisement. We can do better. By looking outside of the field of computing itself, there exists rich information and identity construction strategies developed by individuals who have had to navigate the shifts, convolutions, and problems of social identity and/or have dedicated careers to studying them.

### *3.2. The AIR model of cognitively grounded computational identity*

The AIR Project approach begins with the basic cognitive building blocks of identity (discussed in a subsection) upon which all social identity categories are built. Cognitive scientists have proposed that human conceptual categories form 'idealised cognitive models' (ICMs) upon which categories of objects in the world are built (Lakoff 1987). These ICMs are akin to what are known as ontologies in database research and artificial intelligence (AI) research. Yet, most user categorisation is not done using AI knowledge representation techniques. Technical infrastructures implement and reify (often incorrect) stigmatising identity classification models (Goguen 1997, Bowker and Star 1999). Cognitive science theory is presented below to provide more robust models. These models can explain how users project their identities into their computational surrogates/proxies (Gee 2003).

However, it can also be noted that social infrastructures of classification can serve to reify many different models of identity, only some of which capture the dynamic, constructive, and performed or enacted models encountered in everyday

experience. Furthermore, some classification infrastructures serve to reinforce social ills of discrimination and prejudice. The notion of allowing users to enact their own identities and membership within communities is an important one to allow for users to feel empowered in social computing systems and games.

Identity customisation and experiences of transformative identity in social computing systems rely upon the ability for system authors to explicitly model the effects of social classification infrastructures, such as: viewing oneself differently than others do, performing actions usually attributed to a community outside of one's own, or changing identity based upon learning how to accomplish new tasks or to use new tools. Users may then project themselves into their dynamic computational selves: whether as avatars that change appearance depending upon the skill level of the user as determined by data in a social networking profile, or as characters in a game that gain experience and change from communicating with diverse sets of other characters rather than common mechanisms of combat and acquiring more powerful weapons.

The AIR model (Figure 2) is useful for identifying where schisms exist between a technical structure and a real-world idealised cognitive model as encoded in a classification data structure. A researcher can then construct new structures, using techniques such as those suggested by the AIR Project systems, that more closely align these structures and models in order to construct the hybrid of computationally afforded identities and real-world identities that James Gee calls (2003) the 'projected identity', and as shown in the cognitively grounded AIR model (e.g. a player taking on the role of a priest in a computer role-playing game and trying to be helpful and supportive to her or his friends). The key here is that our understanding of both computational structures and the ways that users interpret them is based in imaginative cognitive processes such as categorisation. The focus on categorisation and classification arises because these phenomena are often reified in infrastructure and are thus amenable to computational modelling. Hence, we shall see that forms of stigma introduced by problematic categorisation and classification models can be addressed computationally.



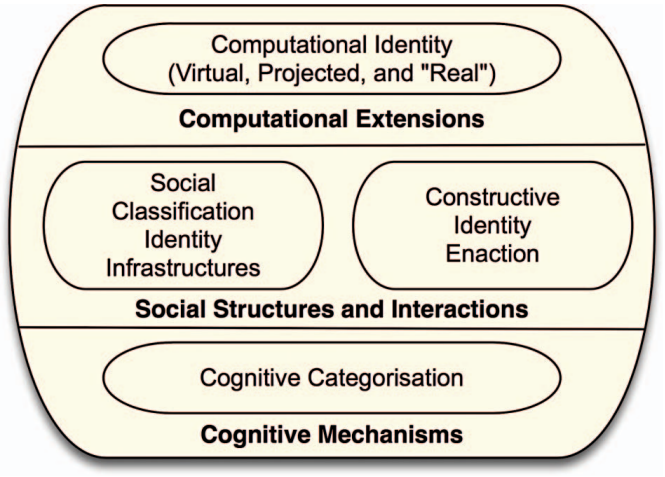


Figure 2. The AIR model of cognitively grounded computational identity.

### 3.3. Cognitive categorisation

The approach to identity here is influenced by the prototype theory of the psychologist Eleanor Rosch, and especially work in categorisation by the cognitive scientist George Lakoff (1987). Lakoff's work in this area over two decades ago is well known and influential, yet it is a thread that has been underdeveloped with respect to issues of social identity construction (an exciting exception being the work of the linguist Otto Santa Ana on conceptual metaphor-based bias (Santa Ana 2002)). Furthermore, this theory has not been significantly applied to cases of identity representation in digital media.

Traditional theories or objectivist views of categorisation hold that categories are defined by the common objective properties of their members. These traditional views are characterised by ideas such as that meaning is based on truth and reference (relationships between symbols and things in the world), differences between physical objects are defined by common essential properties, there is a single correct way of understanding what is and is not true, and all people think by using the same conceptual systems.

The AIR Project draws on, in contrast to traditional and 'folk' theories of categorisation, more recent empirically based theory (Lakoff 1987) which asserts that categorisation is a matter of both human experience and imagination. The cognitive scientist Lakoff asserts that meaning is based upon human experience, consisting of: embodied perception of the world, experience of motor activity, and shared cultural knowledge; and that meaning is constructed by imagination, including: mapping concepts to one another as in metaphor and metonymy, and dynamically constructing mental imagery. This view of categorisation draws on the growing corpus of research from psychology, computer science, neuroscience, anthropology, and more to reveal a convergence of evidence disputing the traditional theory.

Important for the purposes here, Lakoff describes a metaphor- and metonymy-based account of how imaginative extensions of 'prototype effects' result in several phenomena of social identity categorisation that have proven useful for the AIR Project (Lakoff 1987):

- representatives (prototypes): 'best example' members of categories;
- stereotypes: normal, but often misleading, category expectations (e.g. gender stereotypical categories define normative expectations for language use);
- ideals: culturally valued categories even if not typically encountered (e.g. note the difference between an ideal and stereotype – ideal husband: good provider, faithful, strong, respected, attractive; Stereotypical husband: bumbling, dull, beer-bellied);
- paragons: defining categories in terms of individual members who represent either an ideal or its opposite (e.g. 'he is no Turing when it comes to computing', 'it's the Taj Mahal of apartments!'); and
- salient examples: memorable examples used to understand/create categories (e.g. after experiencing an earthquake in California someone may never wish to travel there, even from a place with a higher incidence of natural disaster).

Since the AIR Project technology involves techniques to formalise and implement idealised cognitive models (such as Lakoff's) as computational data structures, identity phenomena such as described above become amenable to algorithmic

manipulation and experimentation. The AIR Project entails computationally modelling such phenomena that define normative expectations and stigma (stereotypes, ideals, salient examples, etc.) within computational identity applications and enabling the possibility for critique and experimentation with identity models that enable users to move beyond disempowering expectations.

### *3.4. Sociology of classification infrastructures*

The approach to computational identity infrastructure design in the AIR Project is influenced by accounts of classification systems from the sociology of science. In Bowker and Star (1999), the case is made that classification systems are necessary for information exchange and communication. They assert that classifying systems allow humans to regularise information from one context to another. Social challenges regarding classification systems arise from cases where tension exists between contexts. In such cases, communication between communities with different classification systems causes disempowering social ills such as prejudice, discrimination, and their 'often attendant violence' (Bowker and Star 1999).

Toward accounting for the interaction between individuals' social identities and classification in different communities, Bowker and Star call attention to the concepts of membership and naturalisation. Membership is the experience of encountering objects and interactions native to particular communities and increasingly engaging in naturalised relationships with them. Naturalisation refers to deepening familiarity with use and enactment involving such objects and interactions. The problem with enforced naturalisation is that it always creates problems of marginalisation. 'Marginal persons' are those who either exist outside of communities or are less 'prototypical' members of communities. Marginalisation can occur through exclusion or through multiple memberships in communities where an individual must switch frequently between interaction and object use protocols within each community, often with varying degrees of success. Typically, when discussing marginalisation it refers to exclusion or difference from normative behaviours (stigma) and/or dominant, privileged, and/or hegemonic communities. The concept of category markedness indicates that, unlike normative categories, marginal categories are linguistically demarcated. Identity torque is where self-classification of individuals differs from how broader society classifies them.

Important tools for bridging between communities are 'boundary objects', defined by Bowker and Star as objects that 'inhabit several communities and also satisfy the informational requirements of each'. An example of a boundary object would be a website that serves both students and faculty members. For Bowker and Star, boundary objects act as a means of resolving tensions between communities without forcing one to adopt the other's norms and practices. The shared architectures of some of the systems developed under the AIR Project implement what Bowker and Star term 'boundary infrastructures'. These are defined as 'stable regimes managing multiple boundary objects, allowing the necessary information to be accessed by multiple communities'. While it is common to imagine that classification systems are objective entities, in subscribing to Lakoff's observations above regarding the traditional view of classification it becomes clear that such is not the case. Indeed, Bowker and Star (1999) assert that:

> Classifications are made of standards, and these standards are developed through a complex and difficult process heavily influenced by social, political, economical factors.

> Classifications are not equal to standards, they are boundary objects among different communities, or better, they are boundary infrastructures.

As opposed to computational identity applications that are based on standard, static classification systems, the dynamically configurable, imaginatively grounded identities of the AIR Project are boundary objects that can customise user information and preferences for particular communities. The power of such models lies in the possibilities they enable for cross-community communication, which is of course necessary in order to challenge the discrimination that occurs at the margins, and lack of diversity inherent in the centre.

### *3.5. Sociology of stigma*

Stigma often occurs in identities at the margins. An important perspective of identity can be found in Erving Goffman's *Presentation of the self in everyday life* (1959). This work provides a basis for Goffman's later work on how stigma is constructed through social interaction and construction. Although his work was not empirical in the sense favoured by much of contemporary sociology, his concepts have been widely influential. In Goffman (1963), he grossly describes three types of stigma. These are differences of: (1) the physical body, (2) individual character, or (3) 'tribal' classes of 'race, nation, and religion'. He describes each of these categories as deviance from 'those who do not depart negatively from the particular expectations at issue', whom he calls the '*normals*'. For Goffman, these hypothetical *normals* are definitional of social norms, some of which may be achievable by a majority of individuals, yet many of which are unavailable to individuals because they are due to unchangeable characteristics, such as skin tone. Yet, in practice, a society may hold norms that are largely unattainable for any of its members. In fact, and provocatively, during his time period in the United States he asserted that (Goffman 1963):

> in an important sense there is only one complete and unblushing male in America: a young, married, white, urban, northern, heterosexual Protestant father of college education, fully employed, of good complexion, weight and height, and a recent record in sports.

In short, almost everyone is stigmatised in some regards, and those who are not soon will be with the passage of time.

He also crucially noted that even those stigmatised by social norms may subscribe to these same norms, inducing self-hatred and other pathologies. Indeed, African American scholars as far back as W.E.B. Du Bois have noted the phenomenon of 'double-consciousness', in which African Americans are dually aware of their own community and self-determined values that recognise their basic humanity, and the broader stigmatising social values (Du Bois 1903). This idea will be taken up more rigorously below in the discussion of classification infrastructures.

This article postulates the idea that the experience of stigma largely rests in our cognitive ability to map characteristics of the second type of stigma, that of character, moral value, will, belief, and passion (Goffman 1963) onto physical characteristics and attendant categorisation into socially recognised races, nationalities, and other so-called tribal classes (which may be described using theories of conceptual metaphor and blending). Secondarily, these mappings are reinforced and reified in social classification infrastructures, including computational infrastructures.

## 4. AIR project systems

Below are a set of examples of recent systems developed as case study AIR Project applications to analyse social stigma and empower users navigating social classification structures and affordances for community formation. Although the problem of designing technologies to dynamic and socially situated user representations while avoiding stigmatising structures is quite broad, the approach here suggests incremental advances predicated on understanding the imaginative creativity that people in real life use to navigate marginal social categories and to create new infrastructures to enable in software the strategies that cognitive scientists and social theorists have articulated in work on classification and categorisation. The initial AIR Project systems fall into two categories: (1) systems to enable critical reflection on disempowering social identity phenomena such as torque and inadequate classifications structures based on identifications with discrete attributes (such as racial labelling on admissions forms), and (2) systems that empower users by providing alternatives to such disempowering structures.

What is sought here is to understand infrastructurally how stigma persists in computational self-representations. Many scholars underestimate the role of stigma as it persists in social computing applications and games, after all users are not limited to our real-world categories, etc. Yet, it makes a difference who uses it: people stigmatise virtual bodies and it also is disempowering to have to play using a representation explicit chosen to be different than your real self in order to eliminate stigma.

### *4.1.* Chameleonia: Shadowplay – *a critical identity game*

*Chameleonia: Shadowplay* (Figure 3) is a prototype critical identity politics game in which an avatar and its shadow (performed and socially constructed selves) dynamically transform, along with the cinematic presentation of the scene, based on player selected gestures and the current location.

This game is meant to suggest naturalisation phenomena such as articulated by Bowker and Star. One of the major ways in which humans naturalise within

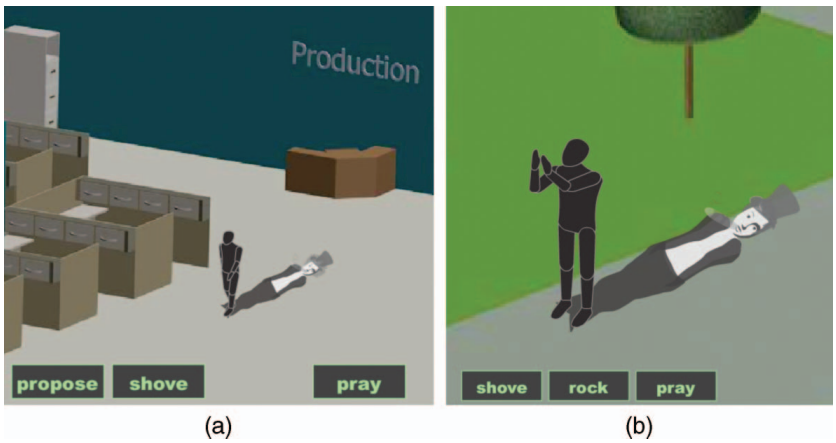


Figure 3. Screenshots of *Chameleonia: Shadowplay*.

communities is by appropriately displaying contextually appropriate gestures. A continuously walking player character transforms dynamically in response to both gesture and context (e.g. suburban, corporate, park, or urban scenes) while the character's shadow transforms differently in parallel. The player character represents the dramatised self in this case, while the shadow represents the socially constructed self. The difference between the two illustrates the concept of torqued identity.

### 4.2. DefineMe: *a critical identity construction social networking application*

*DefineMe*, the first version of which is subtitled *Chimera*, implements aspects of Lakoff's metonymic idealised cognitive models for categorisation to allow users to co-construct their own and others' avatars as boundary objects (Lakoff 1987). The premise behind *DefineMe* is to allow users to define each others' avatars using both commonplace and abstract metaphors. Users can append metadata to other peoples' profiles to drive dynamic generation of avatar images. The initial content domain consists of animal metaphors that can be mixed-and-matched algorithmically. Animal types are potent entrenched metaphors for human personality (Turner 1996) (e.g. sneaky weasels or docile sheep); however, this animal metaphor-based version is only an initial experiment. The model extends to more directly social categories such as scenes, fashions, or movements.

The *DefineMe* database is designed to be lightweight, dynamic, and extensible, while implementing categorical relationships between members. When comparing profiles, *DefineMe* is designed to match lexical items and logical relations directly. In the future it can be developed to compare the structures of profiles following insights from the analogical structure-mapping engine (SME) developed by Forbus (2001) and Gentner (1983).

The *DefineMe–Chimera* application (Figure 4) reported on here focuses on creating metaphorical projections as described above. The *DefineMe* database relies on tags to create additional descriptors for each category or member. For instance, one user could describe a friend as a 'lion' because she 'is' 'strong' (the tag). Another user could add an additional tag, stating that she is a 'lion' because she 'tends to be' 'carnivorous'. These tags can comprise vertical parent–child links (e.g. a 'lion' is-an


Figure 4. A screenshot of *DefineMe–Chimera*.

'animal') or horizontal implicit links (e.g. in another user's profile a 'lion' is an 'Ethiopian symbol', yet the system may still create a category linked by the concept 'lion'). The initial content domain consists of animal types (constructing chimeras) because they are potent entrenched metaphors for human personality (Turner 1996); however, the model extends to more everyday social categories, such as scenes or fashions. The system implements identity torque when the avatars differ from users' self-conceptions.

Following the work of Eleanor Rosch cited in Lakoff (1987), the tagging system could also be used to define aspects of categories themselves. For instance, a 'robin' tag can be added to the category 'birds', to define the prototype of that category. In this way, members can belong to multiple groups, but individuals can represent the prototypical members of groups. Furthermore, the system could use an individual as a prototype stand-in for a category. For instance, rather than just labelling a friend as a lion, one could state that your friend, Emily, is like your friend Bobby because she is brave. The system would then take all of Bobby's attributes and apply them to Emily's avatar, mixing animal types further.



### *4.3.* **IdentityShare***: a critical identity construction social networking application*

*IdentityShare* (Figure 5), a social networking site for 'non-friends', and Daniel Upton's MS thesis project in Digital Media with Dr. Carl DiSalvo as his co-chair, is also developed under the umbrella of the AIR project (Harrell *et al*. 2009).

*IdentityShare* is implemented utilising the same database as in *DefineMe*. The system allows for social networking by providing users with facilities to construct profiles, follow and comment upon other users, and perform game-like tasks that encourage users to consider exploring both like and different profiles of others. *IdentityShare* offers a novel means of self-representation based upon open-ended categories and tags. Standard profile models that typically include normative categories such as name, age, gender, location, and race are replaced with a customisable list that exists as a database, growing as more categories are added. Database consistency is maintained by giving users type-ahead functionality when adding custom categories and by presenting existing categories in order from most common to least common. Users can select which categories are most important to them by indicating that they are primary using checkboxes.

By allowing for primary selection of categories, the system implements centrality phenomena from the cognitive linguistics theories of categorisation above, i.e. 'the idea that some members of a category may be ''better examples'' of that category than others', to a user's profile (Lakoff 1987). This means that a user's profile, as a collection of categories that define a user, is no longer viewed as just a set of static characteristics that are true about this user, but rather as a complex set of characteristics where some may be 'truer' or more definitional to the user's self-conception. To take this even further, a future implementation of *IdentityShare* could offer a ranking system for each category, thereby not only providing centrality, but a centrality gradience, 'the idea that members (or sub-categories) which are clearly within the category boundaries may still be more or less central' (Lakoff 1987). This offers a new dynamic to social network profiling that does not currently exist on the popular social networking sites.


Figure 5. Screenshots of the *IdentityShare* interface.

## 5. Design implications

Design of empowering social identity representation technologies does not mean providing users with an infinite number of options for customisatation. Indeed, we have seen that the close interrelationship between technical components, imaginative cognition, classification infrastructure, performed/enacted identity, and socio-cultural issues of power must be negotiated simultaneously within what I have called a *socio-data ecology* (Harrell 2010). More options are not enough; critically engaged options situated and deployed in the correct contexts are key.

Empowerment here is also not a matter of just introducing a different set of norms and forcing those upon users. Rather, each system is seen as encoding its own set of values and creating a dialogue between those values and users' values. The argument here is to be explicit about these values and producing technologies that are extensible so as to customise in diverse contexts rather than arguing for universal options for identity representation.

At the same time, the critical stance taken here toward the role of visual customisation offices does not mean reducing the necessity of system designers to implement platforms capable of representing diverse identities. Yet it does realise that in systems geared toward self-representation we can expand accommodation by addressing diverse epistemologies and not only appearances.

All of this suggests several broad strategies in designing empowering and critical identities in social computing, gaming, and related social-identity applications.

- Inventions: these are novel systems designed to enable ways of communicating and playing that are as of yet unanticipated or that extend current systems in unique ways. *IdentityShare* would be a modest example of such a system – it is based on imagining ways to meet non-friends and form impromptu communities and developing technologies to meet this aim.
- Proactive interventions: these are systems intended to make specific critical commentary and to spark social and conceptual change in users. The process of creating such systems may entail assessing values built into pre-existing similar systems and building critically oriented values explicitly into new systems. *Chameleonia: Shadowplay*, based on its engagement and implementation of concepts such as double-consciousness and torque, is an early sketch of such a system.
- Remedial interventions: these are systems that offer more empowering, positively diversifying, and/or critically engaged identity representation options. *DefineMe: Chimera*, as it is built in Facebook, can be considered such a system.



Moving beyond utopian views that celebrate computational identity technologies as eradicating the phenomena of stigma merely by allowing users to create 3D graphical avatars, this article has looked at the ways that identity politics of race, gender, ethnicity, as well as more general issues of marginalisation, community exclusion, and naïve classification, persist in the use and implementation of current systems.

Computational identity representation technologies, including games, social networking sites, and virtual worlds, allow both (1) uniquely computational modes of self-presentation (e.g. uploading personal information into a database that is later presented through an online profile or creating a 3D graphical avatar) and (2) extensions of real-world facilities to engage in discourse practices, self-dramatisation, and community creation that also exist offline (e.g. voice chatting or videoconferencing). In light of this duality, the AIR Project theories and technologies described above serve two goals, (1) critical reflection on, and (2) user empowerment over, stigma.

### *5.1. Creative critical reflection on stigma*

Some of the works that ICE Lab has created are cultural products intended to aid users in understanding social phenomena of stigma. These are subjective projects for

users to interpret, in a sense creative artworks, rather than empirical experiments for conceptual change (although the latter is a future goal). In particular, projects such as *DefineMe* and *Chameleonia* are intended to reveal the limitations of discrete/folk classification infrastructures, the socially constructed nature of the self, and phenomena of torqued identity/double consciousness that arise in stigmatised individuals and communities. To assess more carefully how this critique functions, this subsection describes design considerations in implementing the two social networking applications described above.

When social stakes are low, many people are inclined to reveal their adherence to stigmatising norms and to project those norms onto others. Indeed, in a project such as *DefineMe–Chimera* the potential for using the system to ridicule and ostracise is quite apparent. Yet, these potentially disempowering uses are not seen as drawbacks of the systems. The system is considered to be a culturally situated critical intervention, rather than a usability-oriented productive application. In bringing to light more nuanced and imaginative stigma phenomena, such as potential ostracism, prejudicial exoticising of other people, or unflattering labelling, it also provides the potential to disempower such phenomena through dialogic engagement. The system can be considered to be a provocative cultural intervention situated in an environment increasingly encroached upon by hegemonically enforced, often corporately determined, norms regarding of user identity. As such, a system like *DefineMe* succeeds only to the degree that it engages users as an evocative tool to inspire critical thought, and is construed as adequate for capturing personalities using archetypical avatars or conjure the sensation of experiencing the web through another's eyes. Beyond this, however, the systems are prototypes that suggest directions that could enhance the expressive and empowering potentials of productive, utilitarian, or commercial systems such as computer games and popular social networking sites with features such as self-definition of categories and deployment of imaginative metaphor.

Despite the provocative and critical interventionist stance taken, the systems are engineered to mitigate against abuse, and certainly distress of users is not a goal. Looking at the two systems consecutively, mitigating factors designed into the systems are as follows:

*DefineMe: Chimera Design Factors*

(1) Users are only allowed to tag their Facebook 'friends' who have added the application.
(2) Users can access a limited database of animal types.
(3) Users must 'opt-in' to receive a generated avatar.
(4) Users can 'opt-out' at any time.
(5) Users' database entries can be edited by moderators.
(6) Users have access to only a limited format for tagging each other.
(7) Users can delete entries on their profiles that others have created.

Together, these factors strongly help to avoid the system's potential to be applied in an overly negative manner. It is a contract between friends to sign up for potential compliments, teasing, and both self and social insights. Ultimately, *DefineMe–Chimera* is intended to present users with a controlled experience of torqued identity. The fractured identity of a monstrous chimerical representation is, then, an accurate

reflection of the limitations of applying modular and discrete classifications to a real-world biography.

### 5.2. *Creative empowerment of users against stigma*

Aside from the sort of critical reflection that artworks provide, there are practical results of the AIR Project technologies. These can be summarised as follows. (1) Insurgent metaphors are instantiated. Insurgent metaphors, as defined by Otto Santa Ana in his work in critical discourse analysis, are conceptual metaphors explicitly designed to replace social metaphors that induce stigmatising bias (Santa Ana 2002). The AIR Project systems also allow for (2) dynamic construction of user categories based on empirical results in how humans actually categorise in the world, with features such as centrality gradience and prototype-based grouping as occur in *DefineMe*. AIR technologies also (3) provide new modes of community formation as in the involuntary communities that Upton's *IdentityShare* enables. Finally, the AIR Project systems provide for (4) user-defined and user performance-based support for identity/naturalisation. For example, the user's self in *IdentityShare* is primarily presented through database fields that users' themselves determine and through the performed action of surfing the internet.

As done with *DefineMe–Chimera* above, the following assesses more carefully how these empowering affordances function, the below elaborates discussion of *IdentityShare* also first articulated in Harrell *et al*. (2009).

Regarding *Identity Share*, empowering design functions implemented include the following.

*Identity Share Design Functions*

(1) Users can create their own self-classifications.
(2) Users can select which classifications are important to them in defining communities (that others do not have to explicitly opt in to).
(3) Users can avoid or utilise normative categories such as gender or occupation.
(4) Users can allow or disallow the system's tracking of their web visitation paths at will.
(5) Users' real-world identities are kept anonymous.
(6) Users' perceived affordances to communicate with one another are highly restricted.
(7) Users have full control to delete any of their data in the system.

These factors were developed over the course of iterative refinement of the project based on informal user feedback (mainly via open-ended interviews). The greatest challenge with the system is to allow for user-generated categories while also pruning sparsely used and idiosyncratic database elements. A second challenge regarding anonymity and privacy is addressed by careful controls such as articulated above, and by providing quite clear and prominent information on the nature of the site. Quite contrary to being a site to allow people to 'spy' on others, it is an 'opt-in' site oriented toward users with a desire to share their personal styles, definitions, and web behaviours with one another. Finally, it is a system that is proposed as a balance between the limited and discrete, yet highly modular, data structures provided by computing and the continuous and transient, yet not computationally amenable, identity phenomena as experienced in the real world.

## 6. *Final remarks and future work*

Tackling issues of stigma is admittedly an incredibly ambitious goal. Situating this goal as closely related to computing and cognitive science research is also risky as both the issues and terminology are usually seen as the realms of the social sciences and the humanities. Yet, these are some of the most fundamentally divisive issues in societies across the globe. They are also woefully under-researched, even in human-centred computing fields such as computer-supported cooperative work or other user-centric areas of human–computer interaction. In addition, by invoking a broad interdisciplinary theoretical framework centred upon seminal works necessarily there is omission of many nuanced accounts of the social phenomenon of stigma.

Yet, given all of these challenges, this early work can still make a worthwhile contribution to the area of research in cognition and creativity. The central argument has been that phenomenon of stigma is actually implemented via software, it is not only a social concern has been carefully formulated with sociological motivations grounded in well-known results from cognitive science and provided a framework upon which more nuanced phenomena can be investigated. Lastly, future work will engage empirical research in sociology to develop effective strategies for changing attitudes regarding stigmas that are well known social ills, such as racism.

The author has proposed an evaluation framework for this research. The framework is based in a venerable methodology for qualitative research from sociology called 'grounded theory techniques' (Strauss 1987, Glaser 1992), augmented by contemporary theory from cognitive linguistics called 'critical discourse analysis' (Santa Ana 2002). Grounded theory techniques will be useful here because they reveal qualitative patterns within data without a-priori hypothesising about outcomes. In the AIR Project, these patterns involve the nature of projected identities (Gee 2003) for satisfying users' in-application needs and imaginative self-determinations of identities. Because projected identities are the results of conceptual metaphor (i.e. projection of the 'source' space of self-conception onto the 'target' space of a computational representation) (Lakoff and Johnson 1980, Grady *et al.* 1999), methods to elicit, discover, and characterise metaphors from user-generated discourse are necessary. Conceptual metaphor-based critical discourse analysis has been applied for these purposes and has even been used to elucidate metaphors for racism and bias within a corpus, as well as the types of inferences that these metaphors enable (Santa Ana 2002). The steps would be performed on a corpus of data elicited from users about their experiences in games/social networks initially through concurrent and retrospective verbal protocols, open-ended interviews, questionnaires, and transcripts of online experiences, so that the investigators can triangulate insights based on these multiple sources and schemas.

This effort has already been initiated. As preliminary pilot work, data from another study (Veeragoudar Harrell and Abrahamson 2008) (in which high school students deployed avatars in the virtual world *Teen Second Life*) has been analysed by the author and a collaborator. From this analysis, we found three distinct dimensions of students' stances toward the construction and use of avatar-based identities (Veeragoudar Harrell and Harrell 2009). The three dimensions are named below.

(1) Everyday vs. extraordinary graphical appearance: avatar appearance can range from the everyday to the extraordinary or fantastic. Students tend

toward preferring one or the other extreme, although a preference for anthropomorphic avatars was observed (likely due to the platform).
(2) Mirror (first person) vs. character (third person) ontological status: student perception of avatars ranged from virtual representations of their real selves to perceiving them as characters external to themselves operating, or to be operated, within the virtual world.
(3) Instrumental/playful use: students' uses of avatars ranged from their instrumental deployment as tools to accomplish tasks and proxies for them to act in the virtual environment to accomplish tasks construed as computational to deployment gamelike personae as a means for engaging in imaginative identity play.

A second round of pilot data has been collected. This consists of semi-structured clinical interviews (Ginsburg 1997). The objective was to elicit users' tacit knowledge of requirements for identity applications and any potentially stigmatising or empowering affordances of the systems. The site of the study was a school for female refugees in Atlanta, Georgia. This provided a diverse population consisting of novice game users. The study assessed the creation of computational identity representations across several software application cases. Three representative games and self-representation systems were selected: a web-based version of the *Nintendo Mii Channel, The Sims*, and *Elder Scrolls IV: Oblivion*. Participants completed a questionnaire, constructed to avoid articulating the hypotheses of the study and biasing participants. Collecting demographic data was accomplished separately from site records to avoid bias due to the well-documented issue of stereotype threat (Steele 1999). All interviews were recorded using digital video and all sessions were screen-captured. These data will be used to iteratively refine, adapt, and generalise the three dimensions above and to guide development of a subsequent study.

Finally, the argument put forward here is not a case of technological determinism. Building robust and sensitive new systems does not itself constitute empowerment. We have seen that the types of social computing and identity representation systems described here exist within socio-data ecologies – wherein technical infrastructure, specific data structures and algorithms, and specific code co-exist with embodied experiences, subjective interpretation, power relationships, and cultural values. This means that we must also avoid the temptation to discount technology design as social intervention and to place the onus all on the creativity of end-users. Rather, as a theorist–practitioner–user, I consider myself a stakeholder and my own mode of intervention can encompass design and implementation. Furthermore, I would like to develop enabling ideas and systems for others. Only waiting for major software application producers to improve their systems ultimately constitutes just another type of disempowerment. Not everyone is a software designer, but to achieve the dream that computational identity technologies can serve empowering ends we need support on all fronts including creative users of technology, technology designers and producers, and co-creators all along the spectrum in between.



## References

Barros, A.C.D. and Duarte, C., 2009. Assistive devices – stroke patients' design. *In*: *Proceedings of the 7th Conference on Creativity & Cognition*, 26–30 October, Berkeley, CA. New York: ACM Press, 79–86.

Bethesda, 2006. *Oblivion*.
Blizzard, 2005. *World of Warcraft*.
Bowker, G.C. and Star, S.L., 1999. *Sorting things out: classification and its consequences*. Cambridge, MA: MIT Press.
Du Bois, W.E B., 1903. *The souls of black folk*. Chicago, IL: A.C. McClurg and Co.
Forbus, K.D., 2001. Exploring analogy in the large *The analogical mind: perspectives from cognitive science*. Cambridge, MA: MIT Press.
Gee, J.P., 2003. *What video games have to teach us about learning and literacy*. New York, NY: Palgrave Macmillan.
Gentner, D., 1983. Structure-mapping: a theoretical framework for analogy. *Cognitive Science*, 7, 155–170.
Ginsburg, H.P., 1997. *Entering the child's mind: the clinical interview in psychological research and practice*. Cambridge, MA: Cambridge University Press.
Glaser, B., 1992. *Basics of grounded theory analysis*. Mill Valley, CA: Sociology Press.
Goffman, E., 1959. *The presentation of self in everyday life*. New York, NY: Anchor Books.
Goffman, E., 1963. *Stigma: notes on the management of spoiled identity*. Englewood Cliffs, NJ: Prentice Hall.
Goguen, J., 1997. Towards a social, ethical theory of information. *In*: G. Bowker, L. Gasser, S. Leigh Star, and W. Turner, eds. *Social science research, technical systems and cooperative work*. Mahwah, NJ: Lawrence Erlbaum Associates.
Grady, J.E., Oakley, T., and Coulson, S., 1999. Blending and metaphor. *In*: G. Steen and R. Gibbs, eds. *Metaphor in cognitive linguistics*. Amsterdam: John Benjamins.
Harrell, D.F., 2008. Digital metaphors for phantom selves: computation, mathematics, and identity in speculative and fantastic fiction and gaming. Paper presented at *The 29th International Conference on the Fantastic in the Arts*. Orlando, FL.
Harrell, D.F., 2009. Computational and cognitive infrastructures of stigma: empowering identity in social computing and gaming. *In*: *Proceedings of the 7th Conference on Creativity & Cognition*, 26–30 October, Berkeley, CA. New York: ACM Press, 49–58.
Harrell, D.F., 2010. Toward a theory of critical computing: the case of social identity. Representation in digital media applications. *In*: A. Kroker and M. Kroker, eds. *CTheory. Code Drift: Essays in Critical Digital Studies*. http://www.ctheory.net/articles.aspx?id=641 [Accessed 13 May 2010].
Harrell, D.F., Upton, D., Medler, B., and Zhu, J., 2009. *DefineMe*: a cognitive and computational approach to critical digital identity representation in social networking applications. Paper presented at *Digital Humanities Conference*. Baltimore, MD.
Lakoff, G., 1987. *Women, fire, and dangerous things: what categories reveal about the mind*. Chicago, IL: University of Chicago Press.
Lakoff, G. and Johnson, M., 1980. *Metaphors we live by*. Chicago, IL: University of Chicago Press.
Santa Ana, O., 2002. *Brown tide rising: metaphors of latinos in contemporary American public discourse*. Austin, TX: University of Texas Press.
Steele, C., 1999. Thin ice: stereotype threat and black college students. *The Atlantic Online*, August.
Strauss, A., 1987. *Qualitative analysis for social scientists*. Cambridge: Cambridge University Press.
Turner, M., 1996. *The literary mind: the origins of thought and language*. New York, NY: Oxford University Press.
Veeragoudar Harrell, S. and Abrahamson, D., 2008. It takes a virtual village: living and learning in online virtual reality. *In*: J. Mahiri and C.D. Lee, eds. *Symposium presented at the annual conference of the American Education Research Association*. New York, 24–28 March.
Veeragoudar Harrell, S. and Harrell, D.F., 2009. Exploring the potential of computational self-representations for enabling learning: examining at-risk youths' development of mathematical/computational agency. Paper presented at *Digital Arts and Culture Conference*. Irvine, CA.