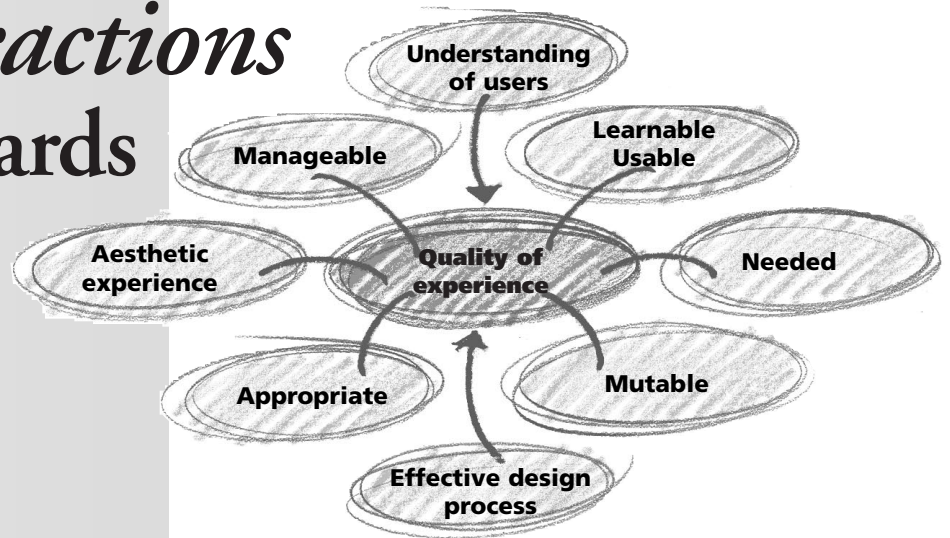# Cultural Representation in Interface Ecosystems: Amendments to the ACM/interactions Design Awards Criteria

Andruid Kerne

The *interactions* Design Awards' Quality of Experience Criteria (see *interactions*, iii.3, May+June, 1996) provide a strong foundation for evaluating human—computer interactions. Especially praiseworthy are the multidisciplinary range of the criteria, the attention to understanding how computer-based media work in their larger context, and the credence given to the relationship of the process of interaction design to the resulting product. I listened closely to the Design Awards committee's desire to "stimulate discussion, ... [and] spawn new ideas." [1, p. 13] Buried in the criteria are challenges that I would like to address. While these guidelines are on the right track, I want to reorient them by focussing on the role of culture. I'll start by defining "culture." Then, with culture in mind, I'll examine the question the Design Awards committee answered in forming the criteria, as well as the resulting guidelines. I'll propose two forms of amendments: modifications to the formative question and the guidelines themselves, and the establishment of a new *cultural representation* guideline. This initiative applies human—computer interface ecology—a theoretical framework to support the analysis and development of interfaces as part of our cultural relationships. Using our diverse cultural heritage will support our efforts to make computers more responsive to human beings.

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Culture

I consider here the ongoing, mutually recursive networks of processes, and resulting products that form our collective subjectivities in order to begin addressing the function of culture in human–computer interfaces, and the function of human–computer interfaces as culture. With acknowledgment especially to the anthropologist Clifford Geertz [6], I define "culture" as

- The tangible manifestations of a way of life.
- The open set of everyday behaviors and ritualized practices that characterize the social actions of a group of people, as well as associated artifacts, values, and states of consciousness.
- An aggregate assemblage of expressions through all media—including verbal and visual languages, art, and production—and the aesthetic sensibilities that underlie these expressions.

Aesthetics, in turn, is the way we give form to values. Human history is rich in its variety of aesthetic modes. Clear articulation of a range of cultural potentials in the criteria can cast the *interactions* Design Awards into a leading role in encouraging the development of cultural expression in human–computer interactions.

The Original Question: Adding Value to Products

Language throughout the original Design Awards Criteria speaks in terms of product, because the Design Awards committee formulated the guidelines by answering the question, "What is interaction design, and what value does it add to products?" This starting point is bound in a market-driven cultural context. Adding value to a product is quite different, even, from representing the values, aesthetics, and positions of constituents. While attending shortsightedly to the immediate goal of the bottom line may seem sensible in some industrial contexts, a design *modus operandi* based on this kind of value may short-circuit explorations of the realm of interactions that could better serve the constituents. Advances in the art can come from an experimental, open research process that may prove both satisfying and profitable in unexpected ways. Indeed,

regarding interactions that involve the growing mass audience of consumers, satisfying interactions are quite likely to serve the bottom line. It will be beneficial to phrase the question as, "What is interaction design, and how can it enrich user experience?"

The inclusion of the digital music stand among 1996 Design Awards winners seems to indicate that the awards committee wants to include more than products. That project was developed by an interdisciplinary team at Carnegie Mellon University, with no expectation of commercial production and with the goal of "... facilitat[ing] the individual practice, group rehearsal, and formal performance needs of symphony musicians..." [7, p. 27] The designers consciously accommodated the mistrust of technology that was part of their users' cultural makeup. I hope to see more noncommercial projects in future awards.

Although the market is currently the most likely mechanism to raise funds for producing an interactive media environment, other development may center on needs and desires in contexts such as research, art, and community. I hope the development of some responsive, expressive, culturally sensitive interface ecosystems can proceed in arts institutes and academic and commercial environments. Industry requires this sort of basic research to generate innovation. Let the Design Awards Guidelines gird these developments. To extend such support, I will proceed to sift through the original guidelines and unearth opportunities for cultural initiative.

Understanding of users…understanding the needs, tasks, and environments of the people for whom the product was designed…[1, p.15]

In the day-to-day use of human–computer interfaces, we can identify the cultures of many constituent groups. The hardware designer, the operating systems software designer, and the applications software designer each have a cultural background, and many more may be represented among the potentially diverse group of users. Corporate cultures, national cultures, ethnic cultures, the culture of the Internet, and other subcultures may all come into play.

The cultural composition of a digital information space may limit its audience. Currently the field of human–computer interface design is dominated by male, Euramerican engineers and their milieu. This limited cultural representation is reified by prevailing attitudes in many so-called interdisciplinary teams, in which "technical wizards" talk down to graphic designers and other professionals who don't understand everything about the technology. We can see this reflected in the error reporting of all Microsoft Windows and DOS products, which include the infamous "Abort, Retry, Ignore" dialogue box, and of MacOS, which offers helpful messages, like "System Error 21," when it crashes.

As more cultural modes are represented in human–computer interfaces, more people will find them accessible. Digital interactions should speak in the languages of their users. The cultural morés of users as well as engineers should be represented. Sloppy reliance on technical jargon is a sure way to produce alienation among many constituents. These criteria can be represented explicitly:

Understanding of users…understanding the needs, feelings, tasks, and environments of the people for whom the media environment was designed…Were communications about the interface during the design process conducted more in the languages of the users or of the designers? Do the resulting interactions speak in the users' languages?

Effective design process

Effective design process…What methodologies were employed, such as user involvement, iterative design cycles, and interdisciplinary collaboration?[1, p.15]

As the committee noted, the design process and the resulting product are inexorably linked. We have only begun to scratch the surface of innovation in the process of interaction design. Iterative design cycles and user involvement are beginnings, not endpoints. The process of interdisciplinary collaboration needs to evolve. Interface ecology sustains interdisciplinary work by developing a common language for interdisciplinary communication and individuals who can work in multiple modes, such as art and science.

Experimental theater provides one example of a domain where group process has been refined. In the early 1960s, Joseph Chaikin's Open Theater developed interactive games for ensembles. "Workshop process" restructured theater to give the ensemble power in generating the material of a performance, instead of being held captive by the text of an author as interpreted by a director. Augusto Boal's Forum Theater developed a set of games specifically focused on drawing out political conflicts among community members into theatrical interactions [3].

We can draw from these and many more process models for social interaction, while creating human computer interaction models in diverse situations ranging from industrial workflows to edutainment focus groups. We can give users power in the process. We can make building cultural and conceptual human relationships the hallmark of building interfaces. As the OED defines ecology as, "that branch of biology which deals with the relations of living organisms to their surroundings, their habits and modes of life,…" so by attending to the open set of concomitant relationships, we can develop the ecology of the interface. Amended guidelines can read:

Effective design process…Were ecological methodologies—such as improvisational games, user involvement, iterative design cycles and interdisciplinary collaboration—employed? Did the process include an open-ended period of exploration? How were users represented in the process?

The "Appropriate" guideline mentions culture explicitly. Unfortunately, it is raised in the context of solving a problem. "Problem solving" is a semantic shorthand for the scientific mode of inquiry. While this mode contributes significantly to the development of beneficial media environments, it can also serve as a limitation. When interaction's *raison d'être* is rooted in other social activities, such as having fun or stimulating thought, genesis in problem solving acts as baggage from the period of time before computers were part of society at large. Amended guidelines can read:

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Appropriate Does the design meet its environment on the right levels?… How did considering social, cultural, economic, and technical aspects of the scenario contribute to creating the work? Were associated values reflected consistently through the design and construction processes to emerge clearly articulated in the resulting product?

Aesthetic Experience

Aesthetic experience Is using the media environment an aesthetically pleasing and sensually satisfying one? Is the product cohesively designed, exhibiting continuity and excellence across graphic, interaction, information and industrial design? Is there a consistency of spirit and style? [1, p.15]
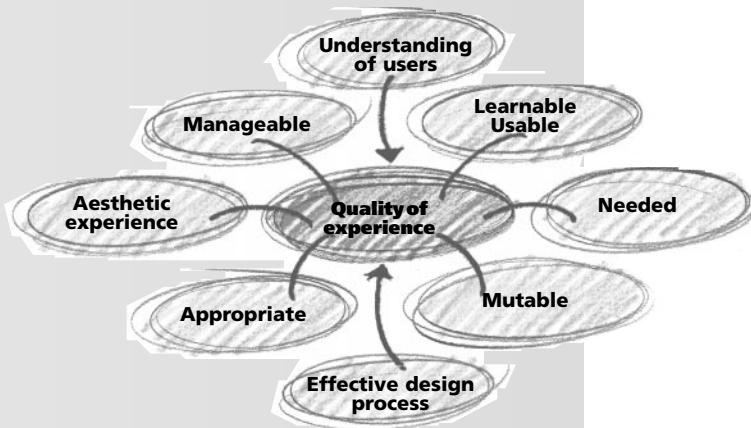
The "aesthetic experience" criteria seem a bit confused in their current form. One critical concern that I am pleased to see reflected here is the need to integrate different disciplines while designing interactions. I can only appreciate the need to consider "graphic, interaction, information, and industrial design," not to mention the environment and culture of users and designers, as part of a single ecology to be addressed as a whole.

At the same time, I see many problems in this guideline as drafted. Cultural expressions, such as human–computer interactions and their environments, might challenge expectations as well as fulfilling them. They may express conflicting positions of different constituents. Rather than strive for a modernist ideal of simply solving all our problems with unified engi-

neering, they may acknowledge their inherently postmodern position in the information age. Vannevar Bush and Ted Nelson foresaw the power of hypermedia to support annotation, a mechanism that offers great potential for self-reference and the representation of conflicting perspectives. Early 20th-century art works, such as the assemblages of Marcel Duchamp, long ago broke our notion of the privileged masterpiece. Discord and disjunction may be just as valid as cohesion and unity. What is critical for work in all media is attention to the whole across diverse dimensions.

The Chinese painter and calligrapher Kwo Da-Wei writes, "Natural ugliness can be artistically beautiful. The scope of subject matter is really unlimited. The Ya [elegant, refined] flavor lies in the quality of the brushwork, not in subject matter." [8, p. 81] The qualities "aesthetically pleasing and sensually satisfying," as well as "exhibiting continuity," reflect a culturally specific approach, which can function as a kind of subject matter, like natural beauty, and restrict our avenues for appreciating interactions. We can broaden these culturally specific criteria to represent a more diverse constituency. I turn again to humanity's cultural heritage in performance as a source of forms for developing interaction. So, when we evaluate an interactive environment, in addition to asking about quality of experience, I want to include African-American culture, and ask, "Is it funky? Does it get down?" Does it embody the Asian notion of open-ended possibility, or *sats*—"the impulse towards an action ... which can go in any direction" [2, p. 6] or is it restrictively predictable? Embodiment of *sats* takes digital interactions toward their potential to deliver mysteries beyond the user's expectations. By seeking interactions that are motivated by a range of cultures, we can encourage the incubation of new digital forms. Here, amended guidelines can read:

Aesthetic experience Is using the media environment an aesthetically pleasing and sensually satisfying one? Does the environment get down? Is it funky? Does the information space offer an open-ended range of possible user experiences?
Is the interface ecosystem designed with atten-

Broom and Dustpan, by Kwo Da-Wei. Collection, Princeton Art Museum, Princeton, N.J.

The fluid form of Ya brushwork makes subtle distinctions about what details to make clear and which to render as fuzzy. The rhythmic vitality of Chi Yuen flows with the unity of a single breath.

tion to all critical dimensions, exhibiting integration across graphic, interaction, information, and industrial design?

Cultural Representation

Humanity possesses the legacy of great cultural diversity. We can draw on the seed bank of cultural repertoires to access a rich reservoir of possible cultural modes for interaction. Asian cultural forms such as haiku, Chinese landscape painting, and Noh use minimal iconographies to present complex ideas simply. Research might investigate how these traditions can be applied to the construction of iconic digital interfaces. The aesthetic concept of Chi Yuen, or rhythmic vitality [8, p. 74], which addresses the composition of form elements into a strong whole, could be translated into digital domains. We can add this notion to our Aesthetic Experience criteria:

*Does it exhibit the rhythmic vitality of **Chi Yuen?***"

African cultural tradition also offers rich models for interaction that are ripe to play an important role in digital interaction design. For example, in West African performance, the combination of music and dance has also been accompanied by extensive nonlinear structures for navigation.[1] The development of most Western and Eastern dramatic structures follows a prescribed order. In some West African performance, such as the traditions of the Asante and Ewe peoples of Ghana, there

may be many options for progression; these options are signaled dynamically by a master drummer, or a lead dancer, or singer. They are exercised in real time, collectively, by the members of a community. They function analogously to the navigation of a digital information space, in accordance with the intentions of traditional composer-authors. Real world precedents from performance form a pool of cultural expressions that can inform the development of digital interactions. The explicit use of forms and strategies from performance and other predigital art forms is one way of making the real world come alive inside the digital one.

A cultural representation initiative in the *interactions* Design Awards Guidelines can foster the integration of diverse modes of cultural expression into interactive media. In consideration of the importance of cultural factors in human–computer interface ecologies, I offer this new criterion to explicitly gird support in the *interactions* Design Awards to represent human beings in the processes of technology:

Cultural representation How does the media environment embody culture from the real world?
How are diverse cultural perspectives represented in the media environment?

The cultural representation criterion is more than a form of affirmative action. More diverse cultural representation in interface

[1]In the real world, navigation is the process of finding one's way. In digital worlds, navigation becomes a noun, referring to the tools one uses while choosing a path, and also to the information geography that one traverses. Thus interactive navigation design includes structuring information for presentation to the user, as well as providing mechanisms that enable the user to move through the information space [9].

forms will open markets to a wider pool of consumers.

Interface Ecology

Interaction design is an important field, the front end of a rapidly growing medium at the forefront of our civilization. In exploring the process of interaction design, I've referenced ideas from a spectrum of disciplines, including computer science, performance studies, ethnomusicology, and painting. *Interface ecology* structurally embodies the blending of dis-

mitting exchange [9]. For example, Big Bend National Park in Texas is a desert along the Rio Grande, which forms a stretch of the border between the United States and Mexico. U.S. National Park Service literature calls Big Bend "a land of boundaries... where things come together..." [12]. The park and its political infrastructure provide an interface between visitors and wildlife, as well as between nations and peoples.

Ecosystem, the fundamental unit of ecology [4], denotes assemblages of mutually interde-

Master Drummer Francis Kofi (rear) signals dancers Aborchie Etse and Felicia Adeti. Kofi chooses musical passages from the repertory set in real time, and the dancers respond precisely, to navigate through the traditional Ewe piece Adzogbo during a performance of Coded Messages: CHAINS [10] at Panafest 94, Cape Coast, Ghana. Photo © 1994 by Creating Media.

Photo credit: *Creating Media,* http://www.creatingmedia.com

pendent components—each with the complexity of living things— and their inter relationships. My alternative framework shifts the context of ecosystem from biological systems to cultural ones [9]. I refer to "interface ecology" instead of "cultural ecology" when I want to highlight processes of interaction within a cultural ecosystem. Interface ecology examines the multiple levels of cultural interaction that may occur through a single tangible phenomenon. According to Marvin Minsky, the examination of multiple representations is an effective strategy for cognitive modeling, because when one representation fails to explain, another may succeed [11]. I am using some of the same strategies to form this interdisciplinary model as intelligent beings unconsciously use to form cognitive models.

ciplines required for interaction design. It provides a basis for intensifying consistent interdisciplinary work as an alternative to repeatedly starting over from square one. An ecosystem consists of mutually influential entities that together form an environment.

In analyzing the *interactions* Design Awards Criteria, I have referred repeatedly to many kinds of interactions. Social and cultural interactions are related to and part of human–computer interaction. A first task for the interface ecology program is to elucidate the structure of the multiple nested levels of interactions that form the human–computer interface ecosystem.

I broaden applications of the concept of interface beyond science and technology to include all meeting zones of culture. This usage is not new among hackers; now I offer it for broader discourse. Interface refers to a border zone where boundaries are traversed, per-

A *semantic network* is a recursive data structure, borrowed from artificial intelligence [13], that describes the interconnections between the components of an interface ecosystem. Each component may be an easily stated simple element, or an aggregate, composite element formed by a grouping of other elements [9]. The ecology of cultural interactions that sheaths the meeting of a human and

a computer forms a recursive semantic network. Thus, when examining human–computer interactions, with, say, the Netscape browser, we can speak of the immediate interaction that occurs when you click on the "Net Search" button. A platform-dependent window system, such as Microsoft Win32, the Apple Macintosh Toolbox, or X Windows is invoked. The comets swirl over the "N." A Web page is downloaded from home.netscape.com, offering Yahoo, Magellan, Excite, Infoseek, and Lycos, as well as advertisements, logos, and other cultural icons. Inside the "Net Search" microcosm, our expectations of what it might mean to search the Internet, and Netscape's offerings, which are honed from a commercial perspective, are packed with cultural forms. "Net Search" seems to offer a service like a dictionary, which objectively presents Internet information resources. In fact, search engine vendors sell positioning within key words on the open market to the highest bidders. I suppose that even traditional dictionaries, as an authority on definitions, may themselves also function as contested cultural zones of interface between peoples and meanings. Interface ecology examines the "Net Search" composite element on multiple, interrelated levels. It lets us talk about immediate interactions and underlying interactions without getting confused about what we're referring to. The theory and practice of interface ecology is developed in more detail in the Interface Ecology Web at http://www.cat.nyu.edu/ecology.

Conclusion

Free your mind and your ass will follow.
—George Clinton, Funkadelic [5]

Let the *interactions* Design Awards open the doors to more aesthetic realms for interactions. I want to be challenged by discursive postmodern interactions of juxtaposition and reflection. I want to dance in funky African-American interactions that get down. I want to meditate in Asian interactions that open me to new possibilities. I want to improvise, to be fed stimuli that resonate on many levels, both surprising stimuli that push me to new places and expected stimuli that reassure me.

There is a world of cultural possibilities out there that can be represented in human–computer interfaces. By encouraging the diverse representation of our collective cultural heritage in digital media, the *interactions* Design Awards can broaden our world of interactions.

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reflections

**Homepage graphic for the *Interface Ecology Web* — http://www.cat.nyu.edu/ecology —
where I am developing the theory and practice of interface ecology as one.**
Collage by Cathy Lynn Gasser.

Interface Ecology

Andruid Kerne

An interface functions as
- a means of contact;
- a border zone;
- a layer hosting exchange;
- a nexus where resources — such as information — and power are circulated and transformed;
- a channel through which interactors communicate; or
- a conduit for message passing.

We form conceptual and practical interfaces in layers, to make diverse connections. The process is simultaneously subjective and shareable. An interface ecology is the open set of relationships which situate an interface. In a balanced ecology, scientific methods of deduction and induction, engineering methods of seat-of-the-pants problem solving, and artistic methods of personal expression commingle as equals.

How can we encourage the traversal of borders? How can we enrich the experience of exchange? A good modus operandi is to be open to contributions from any discipline or culture. The process of interrelating disciplines becomes more essential than any one. Jump out of the observer's role. Act deliberately as a participant. Build your own interface ecology. I develop interface ecology in order to connect the diverse worlds I inhabit, and disciplines I practice.