Definitions and Dimensions of Etiquette

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Abstract

This paper addresses the question "Why 'Etiquette'?" What do we mean by 'etiquette' in the realm of Human-Computer interaction? Does a focus on Human-Computer Etiquette provide anything more than traditional usability or human-centered design? And finally, as we explore the topic of human-computer etiquette, do the characteristics of etiquette in human-human relationships give us any special insights for human-computer interactions? This paper provides a review of these questions on the basis of the set of papers and interests expressed in the AAAI Fall Symposium on Etiquette for Human Computer Work.

Introduction

Approximately two and a half years ago, while co-chairing a AAAI Spring Symposium on Adaptive User Interfaces, I took advantage of the fact that, as a co-chair, it was unlikely that anyone would reject my paper to produce a soapbox polemic on the topic of Human-Computer Etiquette [1]. My purpose was primarily to draw attention to what I viewed as a flaw in much of the exciting work in adaptive and intelligent user interfaces in the AI and AI-influenced world. Specifically, that they all too often behaved like little children: interrupting ongoing conversation or work to show off their capabilities at the least sign of interest, that they exhibited capabilities primarily for the sake of showing off what they could do rather than for the sake of helping to advance the goals of their human users (their "betters"?), and that they persisted in exhibiting the same behavior long after it had ceased to be useful or interesting. While this behavior was tolerable in young children and, perhaps, in young systems fresh out of the research lab, such systems needed to "grow up" and participate in the rules and conventions of the societies into which they hoped to be accepted if they were to ever gain acceptance.

In fairness, I wasn't just pointing a finger at the work of others, and I wasn't completely original. On the one hand, Eric Horvitz had written about a similar concern with regards to Microsoft's Office AssistantsTM a year earlier [2]. And for my part, I had noticed similar tendencies in my own projects: for example, pilots deemed initial versions of the Rotorcraft Pilot's Associate Cockpit Information Manager [3] far too willing to provide aiding for behaviors it understood and recognized. On the other hand, we had also noted, that the human pilots in this domain spent as much as a third of their time engaged in inter-crew coordination activities—that is, in "meta-communication" about their intents and plans. We designed and implemented a simple interface which allowed our smart Cockpit Information Manager to participate in that conversation, taking instruction and declaring its intent and its understanding of the pilots' intent. This modification seems to have resulted in some improvement in human + machine system performance, as well as larger gains in user acceptance [4].

In hindsight, I believe that part of the reason this form of interacting with a cockpit "associate" showed improvements was that it fit into the existing "etiquette" that pilots had evolved and expected from any new participant in the domain. The interface we implemented did not exhibit "etiquette" in the general sense of politeness, but it did behave according to the established rules and behavioral conventions of the role within the domain for which it was intended.

These factors have led me to think more deeply about the "etiquette" of human-computer relationships in work domains and, ultimately, to this symposium. What began as an extended metaphor embedded in a rant is now leading to the thought that we may be systematically missing, or at least failing to give proper consideration to, an important aspect of the way our systems will be used.

In the remainder of this paper, I begin by providing some rationale and defense for the choice of the term "etiquette". Next, I address the question of whether a focus on etiquette provides any thing more or different than a traditional focus on usability or human-centered system design. Finally, I provide some characteristics of etiquette in human-human relationships and discuss their impact on the design of human-computer interfaces and human-computer interaction.

General vs. Specialized Etiquettes

Why use the term "etiquette" as opposed to other, related terms that denote other, related fields of study (e.g., social computing [5], embodied or personified agents [6], human centered

computing or design [7], etc.? How does a focus on etiquette differ from these other fields? As described above, it was initially suggested to me as a part of an extended metaphor indicating a direction that sophisticated, adaptive computer interfaces needed to move in if they were to perform acceptably for long term use by humans with jobs to do. It, of course, also has the benefit of being somewhat provocative—especially among those who are used to thinking of computers as either unintelligent tools that must be forced to perform desired tasks, or as demons actively trying to thwart successful human endeavors.

The term is open to multiple interpretations. The American Heritage Dictionary defines "etiquette" as follows: "(1) the body of prescribed social usages. (2) Any special code of behavior or courtesy: *"In the code of military etiquette, silence and fixity are forms of deference"* (Ambrose Bierce). … Synonyms: *etiquette, propriety, decorum, protocol*. These nouns refer to codes governing correct behavior." [8]. Of the two definitions offered, the second is closer to the sense in which I meant, and it led to the definition included in the Call for Participation in this workshop:

> By 'etiquette', we mean the defined roles and acceptable behaviors and interaction moves of each participant in a common 'social' setting—that is, one that involves more than one intelligent agent. Etiquette rules create an informal contract between participants in a social interaction, allowing expectations to be formed and used about the behavior of other parties, and defining what counts as good behavior.

Etiquette, in this sense, need have little to do with politeness or the "social niceties," and specific environments, specific work "cultures," even individual teams of humans will all have their unique sets of expected behavioral norms or etiquettes. Essentially, an etiquette for a specific domain is formed by prescribing some subset of the range of possible human behaviors as appropriate or inappropriate, expected or unexpected for those who participate in that domain (see Figure 1). These behaviors may pertain to speech, dress, movement , etc., or to more specific protocol behaviors (e.g., 'in this plant, we always empty a vessel when it's not in use'). As such, these are the behaviors that any human or automation agent should strive to adhere to if it wants to be accepted into that milieu.

Nevertheless, the first definition applies equally well. Indeed, several of the papers to be presented at this symposium [especially 9, 10, 11 and 12] all take the perspective of etiquette as good manners, though they investigate different aspects of what that might mean and how it might be applied. This is hardly problematic. Just as we encounter multiple etiquettes in our daily lives (what counts as appropriate, expected behavior is *different* at work, in a bar, in church, etc.), so computers designed with etiquette in mind should be expected to exhibit different kinds of etiquette for the different kinds of contexts they are used in.

The relationship between the "good manners" and the "established codes of behavior" meanings of the term "etiquette" seems to be a simple one of general vs. specialized application. The etiquette rules of good manners are general, at least in the

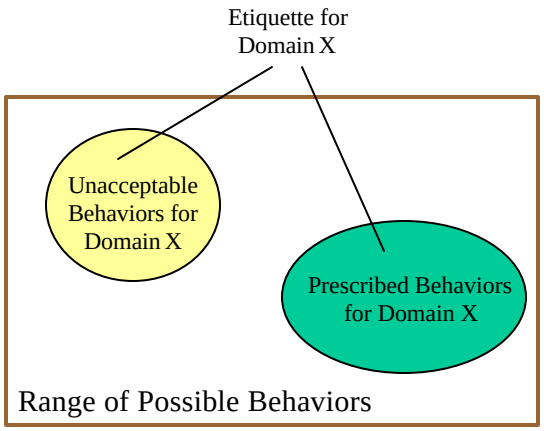

Figure 1. Etiquette for a domain defines acceptable behaviors for that domain.

sense that they are intended to apply in situations where no more specific set of rules is known to apply. For example, the use of "please" and "thank you" and the polite forms of address can frequently be dispensed with, but they are a good way to start an interaction with someone who is unknown to us. In fact, [13] claims that most of the polite forms in conversation, regardless of their specific linguistic or cultural manifestation, are intended precisely to ensure that the least offensive interpretation possible is applied to our utterances and actions.

By contrast, the etiquette rules of specialized domains may be less formal and may involve substantial deviation from the "polite" forms. Work domains are a common sphere in which specialized etiquettes prevail—etiquettes that differ from formal and polite norms. This is true for forms of address and the use of "please" and "thank you," but it is true in more interesting ways as well. For example, (as Reeves and Nass demonstrate [14]) we take it as inappropriate for a conversational partner in social interaction not to maintain a certain amount of small movements—indicative of a lack of intelligence or attention, or of artificiality. Nevertheless, an assistant in a work setting who is always moving about the office may be seen as intrusive or at least fidgety. It is also true that many work domains have evolved highly specialized etiquettes designed to smooth operations and/or ensure safety. The conversational conventions used between pilots and Air Traffic Controllers is one particularly formal example, about which [15] will have more to say at the symposium. When such conventions exist, whether formally documented and trained (as in the air traffic control case) or not, it will be important for computers which wish to perform actions similar to humans in the domain to perform in a fashion that preserves the expected etiquette which those humans would adhere to.

So, in short, both senses of the term "etiquette" seem relevant for human-computer interaction—though perhaps in different settings. Politeness and adherence to social codes will likely be useful in exactly those situations where it is important in human-human interactions: in general situations, between strangers,

when the specific context or relationship with the conversant is unknown, when it is important not to give offense, etc. On the other hand, especially given that computers are frequently (though certainly not exclusively) used as tools in the pursuit of work goals in specific work domains, the specialized codes of etiquette which are familiar and expected in those domains will be important for the computer to use. Workers in an oil refinery are generally not accustomed to addressing each other with honorifics; therefore it is likely that a computer system that does so will be seen as out of place. Pilots acknowledge communications with a "Roger" and rarely use "thank you"; therefore it will be critical for an aviation system to acknowledge communications and it will be unlikely that the use of "Thank you" will be seen as appropriate.

Is Etiquette 'just' good interface design?

The notion of etiquette does, I believe, force us to consider several aspects of human-computer relationships that traditional design concerns do not. By placing the system to be designed in the role of a well-behaved human collaborator we gain insights into how users might like or expect a system to act and how its actions might be interpreted *as a social being* that rarely come from any other source of design (with the possible exception of usability reviews for an already-designed system). I find it instructive to ask, for example, "if this system were replaced by an ideal human assistant, how would that assistant behave?" and, alternatively, "if a human assistant were to provide this information/decision /recommendation/control input in this way, how would s/he be perceived by colleagues?" To pick, perhaps unfairly, on a well-known example: how would a human office assistant who, several times a day, interrupted my work to offer to help me write a letter be regarded?

Would or should traditional approaches to human-computer interface design provide similar insights? Perhaps, but there is a growing set of criticisms claim otherwise. Traditional approaches to HCI design have been criticized for being too focused on a single individual and his or her computer, rather than the role that that individual (and his/her computer) play in a greater team, social and/or organizational setting [16]. Similarly, one of the stated goals of the "social computing" movement is to design human-computer interactions and computer-mediated human-human interactions that foster richer communication and the building of more "social capital" than have traditionally been the case [5] in existing social systems such as the internet. Social capital comes, in part, from interactions that preserve the richer roles and cues of human-human interaction. Finally, in a recent article and forthcoming book [17] Don Norman has augmented his prior calls to usability by claiming that things we regard as beautiful will be used better—not just because we like them (though that effect cannot be overestimated), but also because our liking of them produces cognitive effects including greater creativity and an ability to be less distracted by inefficiencies in either the design or the problem context itself. The relationship between etiquette and aesthetics is far from clear, but insofar as adherence to proper etiquette (whether as politeness or the expected behaviors of the field) produces more "pleasure" than violations of etiquette, Norman's claims should hold for good HCI etiquette as well.

In the end, an etiquette perspective on human-computer relationships may not so much represent a qualitative difference over traditional approaches as rather another perspective that can afford new insights. After all, designing a system for "usability" *should* include designing for user affect, perceived competence and trust, etc. The calls cited above for new approaches concentrating on social or team interactions or on beauty and pleasing aesthetics are *de facto* evidence that traditional approaches have not been completely successful in providing those foci. In the next section, I will describe some insights to be derived from concentrating on the etiquette of relationships (human-human or human-computer). These serve as additional evidence that an etiquette perspective can provide valuable novel insights into the design of computer systems for human work.

Characteristics of Etiquette

The notion of etiquette conveys several profitable characteristics profitable for reasoning about human-computer relationships and that, ultimately, may prove useful in designing better human-computer interactions. Below is a list of some of the characteristics of "etiquette" and some lessons that they teach us for interface design:

Different Etiquettes for Different Interactions.

One such characteristic is illustrated in the discussion in the first section above: different contexts, and different types of interactions have different etiquettes associated with them. We have different rules of expected conduct for formal and informal situations; for work, party, home and church. The appropriate etiquette is, therefore, a function of the set of contexts in which we find ourselves (see Figure 2). Talking about a football game

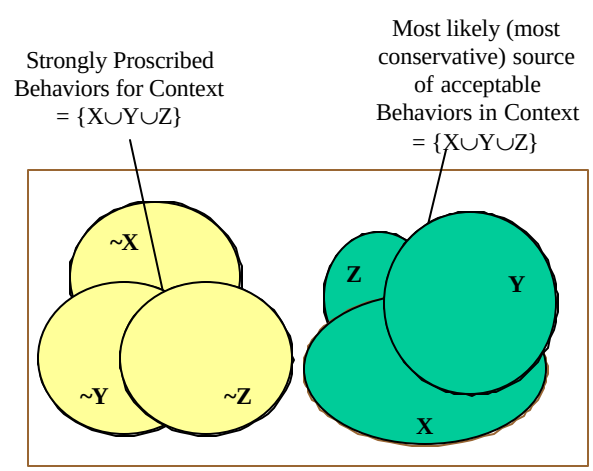

Figure 2. The appropriate etiquette in a context is a function of etiquettes for the set of overlapping contexts in which we find ourselves.

with a work buddy at church would involve a different set of conventions and behaviors than talking about church to a football player we'd just met on a tour of our work environment. As social beings with years of experience, we navigate these extraordinarily complex waters almost effortlessly, but computer systems must be taught them.

Etiquette evolves.

An implication of the role of inter-agent familiarity in etiquette is that etiquette evolves over time. As noted above (and in [13]) initial forms of etiquette tend toward the more formal and polite precisely because these are the most general ways of showing respect and benign intent in most societies. As we become more familiar with a person, or a context, etiquette relaxes, becomes less formal, and typically more efficient. The implication for human-computer etiquette is that some form of learning or tuning may be very useful or necessary.

Etiquette is mostly implicit.

As noted above, the appropriate etiquette for a given specific context is a function of the set of expected behaviors for the overlapping set of contributing contexts. Not only is this reasoning process likely to be very complex, but it is also largely implicit. The reason that Miss Manners and her fellow etiquette mavens flourish is that we are uncertain about what etiquette should be used in various settings. Worse, the introduction of a computer will, necessarily, change existing etiquettes and new etiquettes will evolve—as they have done for email and voice mail [18]. On the other hand, this may be a saving grace for novel technologies—they have some ability to establish their own etiquettes when no prior etiquette (or only conflicting etiquettes) exist.

Etiquette is (only) expected of "intelligent" agents.

Another implication of using etiquette to reason about human interactions is that we don't expect etiquette of inanimate, unintelligent entities. Simple tools like hammers and wrenches (or even sticks and rudders) don't foster, or perhaps need to foster, expectations about appropriate interaction behavior on a social level. It is only as those tools take on more complexity, higher degrees of autonomy and more 'intelligence' that we start to expect them to play by the rules of other complex, autonomous and intelligent entities in our experience—namely, other people. Reeves and Nass [14] both show that our willingness to assume intelligence and agency extends far deeper (and requires fewer triggering cues) than we commonly expected, and offer as partial explanation the notion that we are applying schemas learned for interpreting and interacting with humans to other agents that behave, in some minimal ways, like humans. The implications for design are that, as systems become more complex, adaptive, autonomous, etc., the importance for them to exhibit appropriate etiquette increases—and conversely, the sensitivity of users to inappropriate etiquette will increase.

Etiquette implies a Role.

It is rarely sufficient to simply attempt to adhere to the etiquette of a domain. Rather, domain etiquettes typically define and prescribe behaviors for various roles within the domain. This is true of both the general etiquette of politeness, where roles such as petitioner/requester and responder/provider are highly embedded in polite behaviors, as well as the specific etiquettes of work domains, where the prescribed behaviors differ if one occupies the role of, say, pilot vs. co-pilot. In both cases, the set of prescribed behaviors pertain to a specific role for that domain and if I am attempting to occupy one role while making use of the behaviors reserved for another, I am likely to create even more confusion (and resentment) than if I avoided the use of the domain's etiquette altogether. Imagine, for example, the servant who holds his hand out to be kissed by the king. As Figure 3 illustrates, the acceptable behaviors prescribed by an etiquette for a domain may not be acceptable for all participants (i.e., all roles) in that domain. In fact, what is acceptable and expected for one role may be strongly forbidden for another role. Power relationships are a frequent, and highly important, form of role definition within etiquettes and one which computers and automation can easily transgress in work domains.

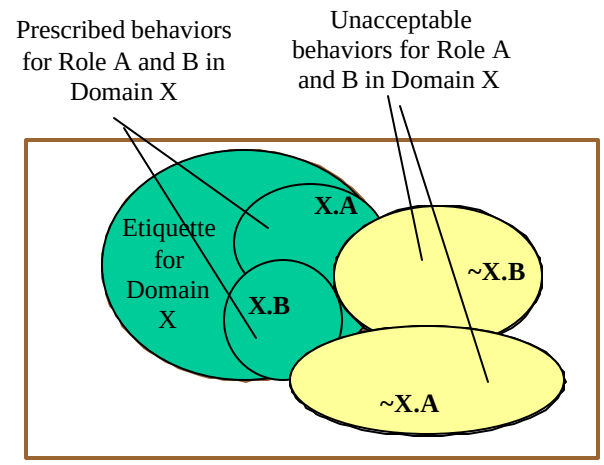

Figure 3. Role relationships with an etiquette for a domain.

Etiquette is Functional, yet Arbitrary.

Another characteristic of etiquette in human-human relations is that it is functional, and that the functions are largely homogenous across societies and cultures, but its forms are arbitrary and highly variable across cultures [13]. For example, most societies have a way of indicating deference in making a request, but the form of that deference changes from society to society—not only specific linguistic items (e.g., "Please", "Por favor", "Sil vous plais",.etc.) but also stances, head and hand movements, etc. change to indicate proper respect, deference and humility. Similarly, work domains evolve specific and frequently arbitrary forms of etiquette to meet the functional needs they may share: for

example, the U.S. military typically uses red to depict enemy forces and blue to depict own forces, while sports teams typically use Xs and Os—in each case, the function is similar and the method chosen to fulfill the function is arbitrary and different. The importance of this functional yet arbitrary aspect of etiquette is twofold. On the one hand, it shows that not all of the constraints that should be considered in design will be present in the world, the physical system or even in the users' cognitive and physical capabilities. Some of them will be present in the social and organizational conventions within which those individuals move and perform their work. On the other hand, it shows that these conventions, though arbitrary, are far from unimportant. Once a convention is in place and adhered to, it can be very difficult, and even dangerous, to change it. Etiquette conventions may be arbitrary, but this does not mean that a newcomer can readily violate or ignore them and behave in novel ways.

Etiquette constraints are "soft" constraints.

While etiquette plays an important role in our social and work interactions, it rarely dictates successful interactions on its own. Etiquette can "smooth the way" for pleasant and/or efficient interactions but, when sufficiently motivated, we can readily "dispense with protocol" and get down to business. This implies that while adherence to etiquette can make interactions smoother, more pleasant and maybe more efficient, considerations of etiquette will rarely make or break a system design in their own right. In this sense, etiquette generally poses "soft" constraints, by contrast to the "hard" constraints that physics and human physiology impose.

The prevalence of the recent Cognitive Work Analysis movement and its claim that interfaces should be designed to convey the set of constraints and capabilities inherent in the work domain provide a framework within which etiquette's soft constraints can be readily integrated. Vicente [19] proposes five levels of analysis to uncover the various constraints which will affect the design of a system for use in a given work context. The goal at each level of analysis is to uncover the purpose-relevant constraints and capabilities inherent in: (1) the physical system or plant, (2) the methods and actions of control, (3) strategies for achieving purposes under various conditions, (4), the social and organizational setting, and (5) the competencies of workers.

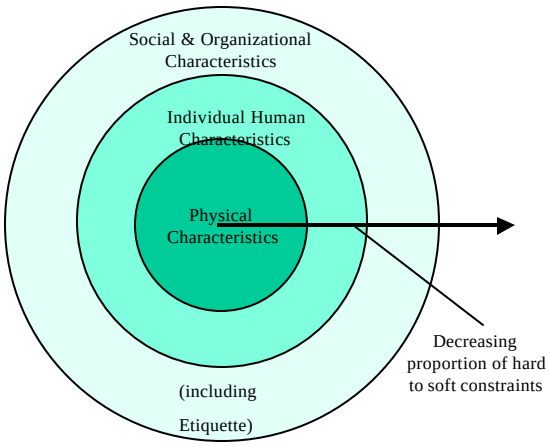

Figure 4. Layers of considerations in system design and their relative proportion of hard to soft constraints.

Etiquette is clearly more relevant at levels 4 and 5. Vicente himself notes (p.115) that there is a progression in these levels from a focus on the "ecology" or world outside the human workers to a focus on human cognitive constraints in the later layers. I see, however, another progression, as in Figure 4, from the prevalence of harder to softer constraints. While it is true that there are soft constraints at the physical levels (e.g., rapid heating and cooling of a vessel weakens its structural integrity and shortens its lifespan), the proportion of hard to soft constraints seems to diminish as one moves toward the social interaction layers. While there clearly are some hard constraints in the social and organization layers (e.g., the rate and distribution of information flow between agents in different organizational relationships), it seems that a far greater proportion of the variables which should be considered about social interactions are soft constraints, such as the expected interaction methods of etiquette.

By definition, violation of a hard constraint results in the failure of the goal, plan or design, while violation of a soft constraint need not always do so and may, in fact, simply result in inefficiency or a reduction in value. If it is true that the majority of etiquette-related constraints are "soft", then it is fair to conclude that etiquette is less important, less critical in some sense than other, harder constraints which bear on system design. Does this mean that etiquette can be ignored in system design? Certainly not in any system or product where user acceptance, ease, and efficiency are concerned.

Etiquette can be used to establish a context or role.

The etiquette behaviors I exhibit provide information to others about the kind of context I believe myself to be in—or the relationship I am inviting you to share with me—and the role I want or intend to occupy within it. In this sense, etiquette is not simply a passive attribute of systems (or humans), but both can actively exhibit etiquette-relevant behaviors in an attempt to shape the environment around them. The use of formal modes of address, for example, indicate that I respect you, but also that this is a formal relationship or context and, therefore, that I don't know or am not comfortable with you. If I invite a student or colleague to "Just call me Chris," I am literally inviting them to share a less formal context with me, and I am purposefully moving toward a less stilted (but respectful) role than "Dr. Miller" might have implied. In work contexts, the use of specific jargon can signal a work setting, while the style in which recommendations are offered (as diffident suggestions vs. commands) signals power relationships and roles regardless of whether the suggestion offerer is human or automation.

Etiquette conveys intentions and capabilities.

Similarly, the specific etiquette behaviors I use do, sometimes regardless of my will, convey information about my intentions and about my capabilities. If I use the jargon of a field or work domain, I convey my competency in that domain and invite those interacting with me to treat me as something other than a novice. This can greatly shorten interactions between co-workers as they get to know one another—but only if each can, in fact, live up to the degree of knowledge their jargon use implies (a potential problem for automation and training and help software). A particular concern about embodied agents [6] and personified automation, especially in high criticality work domains, is that their anthropomorphized aspects invite users to regard them as humans with the full range of human reasoning and affective capabilities. Indeed, work by [14] suggests that humans are all too ready to make that assumption. Again, this is a problem whenever the system cannot live up to that full range of capabilities. The reverse holds as well—and an interesting anecdote may be supplied by the Atlanta airport's ground transportation system. I have heard that the reason this system uses a robotic, synthesized speech recording to inform passengers that the doors of a train are closing is precisely because the designers wanted to convey that the trains (and, therefore, those closing doors) are NOT human-controlled.

Etiquette violations are disruptive, but occasionally useful.

Finally, an implication of the above characteristic of etiquette constraints as "soft" combined with the fact that etiquette behaviors can be manipulated to change an interactee's perception of context, is that violations of the expected set of moves and behaviors in a domain will generally be disruptive, but may occasionally be especially useful. For example, if I command a stranger on the street to "Move!," I have violated several default assumptions about polite society and, by so doing, I have conveyed either that I had a very good reason for doing so (e.g., to save the stranger from the bus that was about to flatten him), or (especially if there was no such bus) that I regard myself as much more important than the stranger and I have little regard for his concerns or feelings. In the first case, my violation of expected etiquette norms legitimately conveys a different context to the stranger than the one he probably thought he was in—one of urgency and danger rather than normal hustle and bustle. In the second case, I have created an enemy and a situation I may have to spend quite some time diffusing if I ever need to interact with that person again.

Computer systems could use the same procedures. Pop up messages saying "Would you like to save this file?" as you close open work under normal conditions would have a very different flavor from a message that said "Save Files Now!!!" which popped up, overlaying existing work windows, in the context of an imminent system crash. Similarly, I wonder about the utility of aviation warning systems that always use the same tone to tell the pilots to "Pull up! Pull up!" even as s/he crashes into terrain. Wouldn't it be more natural, more expected, and quite possibly more effective to have the recorded voice convey a sense of seriousness and urgency in keeping with the system's perceived threat?

Conclusions

The response to the call for papers of the AAAI Fall Symposium on Etiquette for Human-Computer Work has been encouraging both in its variety and depth and in the specific applications and nuances where participants see etiquette as an important consideration in the design of human-computer systems. The question of whether human-computer interactions can have "etiquette" seems to be increasing moot—we behave as if they do and, it appears that investigating the types of etiquette that lead to productive and unproductive work provides us with useful insights into how to design such systems. While it may still be "nothing more than a metaphor," it is becoming increasingly obvious that human-computer etiquette is another dimension of the increasingly complex and omnipresent relationship we share with our computerized tools—and one which will take on even more importance as those tools become more autonomous and intelligent. Establishing a relationship with those tools that we can live with is an increasingly important problem and one which an explicit consideration of HCI etiquette is uniquely suited to address.

Acknowledgements

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