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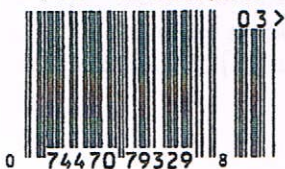
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# Affecting Humanity

TED SELKER

THE future is about creating an environment where the complications and the distractions of technology are not upsetting, diverting, or overwhelming.

Technology is already guiding us to information that is valuable to us, but people care more about relationships and communicating with people—these are the foci in the future.

Our work in the Context Aware Computing Group at the MIT Media Laboratory explores and creates implicit communications between people and computers. Reducing the explicit communication that a person has to do, reducing the focus that a person has on the tools being used rather than on the task at hand, helps us work toward the ultimate goal of decreasing the cognitive overhead for doing the things we want to do.

Focusing on the tool, however, can sometimes remind us of what task we are performing. When we're holding something in our hand, it is a memory aid as well as a tool. So, to some extent, the tools we make have to remind us of what we are doing. People have always abhorred having to remember large numbers of commands and procedures to use computers, and it has quickly become accepted that adaptive user interfaces are essential to resolving this problem. Computers will have to understand what our needs are—they have to remember what we've done in similar situations in the past and anticipate what we could do in future situations.

Many examples exist of adaptive computing, such as the simple properties of the jukebox in the context-aware bed (see [www.media.mit.edu/context/](http://www.media.mit.edu/context/)), which knows what music a user will like at a particular time during the day by analyzing when the user has used it in the past. Other, more complex qualities of the jukebox include suggesting new music a user will like based on what that user has liked in the past.

The social agents that people have talked about, such as Max [1], have demonstrated their usefulness;

straight-ahead learning and concept formation do a good job as well. Interest Tracker [2] is an example of a system in which the model is created specifically out of how a person's eyes move when viewing a computer display. When a viewer's eyes remain on something for a certain amount of time, the system knows this is an element the person wants to follow. The selection process is much quicker than using a mouse for selection and informs the user model about what the person is doing.

We are examining more challenging and exciting possibilities for replacing human activity with computer-enhanced or computer-substituted activity. For example, we're currently exploring making a relationship manager that notices how you are treating people you care about, how you are choosing friends you say you want to spend time with, and encourages you to meet the people you should know. Our belief at MIT's Context Aware Computing Group is that these kinds of decisions can often be better accomplished by a computer than a person.

So what does this leave for a person? A person is left with the adventure, with choosing and creating things to work on, things to find out about, that no one has ever done before. That feeling of adventure, of creating new tools, of finding new possibilities, in some sense is the essence of what it is to be a human. Although seemingly contradictory, humanity is the essence of technology.

Technology at the center. Human relationships as the goal. This is the future. ☐

## REFERENCES

1. Lashkari, Y., Metral, M., and Maes, P. Collaborative interface agents. In *Proceedings of the AAAI'94 Conference* (Seattle, WA, Aug. 1994).
2. Maglio, P.P., Barrett, R. Campbell, C.S., and Selker, T. SUIOR: An attentive information system. In *Proceedings of IUI2000* (New Orleans, LA, Jan. 2000), ACM Press.

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