



## INTERVIEW with Terry Winograd

Terry Winograd is a Professor of Computer Science at Stanford University and one of the founding faculty of a new Interdisciplinary Design Program at Stanford, known as the 'd.school.' He has done extensive research and writing on the design of human-computer interaction. His early research on natural language understanding by computers, was a milestone in artificial intelligence, and he has written two books and numerous articles on that topic. His book, *Bringing Design to Software*, brings together the perspectives of a number of leading researchers and designers.

**YR:** Tell me about your background and how you moved into interaction design.

**TW:** I got into interaction design through a couple of intermediate steps. I started out doing research in artificial intelligence. I became interested in how people interact with computers, in particular, when using ordinary language. It became clear after years of working on that, however, that the computer was a long way off from matching human abilities. Moreover, using natural language with a computer when it doesn't really understand you can be very frustrating and in fact a very bad way to interact with it. So, rather than trying to get the computer to imitate a person, I became interested in other ways of

taking advantage of what computers can do well and what people can do well. That led me into the general field of HCI. As I began to look at what was going on in that field and to study it, it became clear that it was not the same as other areas of computer science. The key issues were about how the technology fits with what people could do and what they wanted to do. In contrast, most of computer science is really dominated by how the mechanisms operate.

I was very attracted to thinking more in the style of design disciplines, such as product design, urban design, architecture, and so on. I realized that there was an approach that you might call a design way, that puts the technical aspects into the background with respect to understanding the interaction. Through looking at these design disciplines, I realized that there was something unique about interaction design, which is that it has a dialogic temporal element. By this I mean a human dialog: not in the sense of using ordinary language, but in the sense of thinking about the sequence and the flow of interaction. So I think of interaction design as being about designing a space for people, where that space has to have a temporal flow. It has to have a dialog with the person.

**YR:** Could you tell me a bit more about what you think is involved in interaction design?

**TW:** One of the biggest influences is product design. I think that interaction design overlaps with it, because they both take a very strong user-oriented view. Both are concerned with finding a user group, understanding their needs, then using that understanding to come up with new ideas. They may be ones that the users don't even realize when you begin. It is then a matter of trying to translate who it is, what they are doing, and why they are doing it into possible innovations. In the case of product design it is products. In the case of interaction design it is the way that a system interacts with the person.

**YR:** What do you think are important inputs into the design process?

**TW:** One of the characteristics of design fields as opposed to traditional engineering fields is that there is much more dependence on case studies and examples than on formulas. Whereas an engineer knows how to calculate something, an architect or a designer is working in a tradition where there is a history over time of other things people have done. People have said that the secret of great design is to know what to steal and to know when some element or some way of doing things that worked before will be appropriate to your setting and then adapt it. Generally you can't apply it directly, but I think a big part of doing good design is experience and exposure. You have to have seen a lot of things in practice and understood what is good and bad about them, to then use these to inform your design.

**YR:** How do you see the relationship between studying interaction design and

the practice of it? Is there a good dialog between research and practice?

**TW:** Academic study of interaction design is a tricky area because so much of it depends on a kind of tacit knowledge that comes through experience and exposure. It is not the kind of thing you can set down easily as, say, you can scientific formulas. A lot of design research tends to be methodological. It is not about the design *per se* but is more about how you go about doing design, in particular, knowing what are the appropriate steps to take and how you put them together.

**YR:** How do you see the field of interaction design taking on board the current explosion in new technologies—for example mobile, ubiquitous, infra-red, and so on? Is it different, say, from 20 years ago when it was just about designing software applications to sit on the desktop?

**TW:** I think a real change in people's thinking has been to move from interface design to interaction design. This has been pushed by the fact that we do have all kinds of devices nowadays. Interface design used to mean graphical interfaces, which meant designing menus and other widgets. But now when you're talking about handheld devices, gesture interfaces, telephone interfaces and so on, it is clear that you can't focus just on the widgets. The widgets may be part of any one of these devices but the design thinking as a whole has to focus on the interaction.

**YR:** What advice would you give to a student coming into the field on what they should be learning and looking for?

**TW:** I think a student who wants to learn this field should think of it as a kind of dual process, that is what Donald Schön calls "reflection in action," needing both

the action and the reflection. It is important to have experience with trying to build things. That experience can be from outside work, projects, and courses where you are actually engaged in making something work. At the same time you need to be able to step back and look at it not as “What do I need to do next?” but from the perspective of what you are doing and how that fits into the larger picture. The courses we are developing for the d.school are all built around this approach. Students work on interdisciplinary projects that are unique to each course, but in all of them we maintain a central focus on being user-centered, developing ideas through iterative prototyping, and being mindful of the design process while engaging in it.

**YR: Are there any classic case studies that stand out as good exemplars of interaction design?**

**TW:** I still use the Xerox Star as an exemplar because so much of what we use today was there. When you go back to look at the Star, it seems very ordinary until you see it in the context of when it was first created. I also think some exemplars that are very interesting are ones that weren't commercial successes. For example, I use the PenPoint system that was developed for pen computers by Go. Again, they were thinking fresh. They set out to do something different and they were much

more conscious of the design issues than somebody who was simply adapting the next version of something that already existed. PalmPilot is another good example, because they looked at the problem in a different way to make something work. Another interesting exemplar, which other people may not agree with, is Microsoft Bob—not because it was a successful program—because it wasn't—but because it was a first exploration of a certain style of interaction, using animated agents. You can see very clearly from these exemplars what design trade-offs the designers were making and why, and then you can look at the consequences.

**YR: Finally, what are the biggest challenges facing people working in this area?**

**TW:** I think one of the biggest challenges is what Pelle Ehn calls the dialectic between tradition and transcendence. That is, people work and live in certain ways already, and they understand how to adapt that within a small range, but they don't have an understanding or a feel for what it would mean to make a radical change, for example, to change their way of doing business on the Internet before it was around, or to change their way of writing from pen and paper when word processors weren't around. The designer needs to envision things that fill real needs for users, but which the users can't yet envision. ■