

# Wearable computers scale the language barrier

I found myself in a quandary when given a demonstration of LingWear: how do I phrase the question so the device knows exactly what to translate?

LingWear is a wearable tourist information system developed by Carnegie Mellon's Interactive Systems Lab (ISL). The system translates language to help its users communicate when traveling abroad.

If LingWear wasn't here to help, would the person I want to communicate with even be able to understand me, even if I did know the language? If I were traveling abroad and I needed to get a hotel room for the night, or I needed to find a doctor, how would I trust that my language and communication skills were strong enough to get my message across to a hotel clerk or a person on the street?

Many Americans, like me, don't speak German, Japanese or any language other than English well enough to feel at ease communicating abroad. It's not just the language barriers that can feel intimidating; it's the cultural differences in how we communicate and in what we understand that can make communicating seem a challenging and daunting task.

In the beginning of this demonstration, though, my thoughts are elsewhere. I'm in Newell-Simon Hall. I'm behind closed doors in the Language Technologies Institute's ISL department.

Tanja Schultz, a research scientist and speech recognition specialist, is seated beside me. We've just discussed LingWear and its speech recognition and speech translation capabilities that allow it to take my question, in audible or text form, and to output it in German or Japanese so the imaginary hotel clerk and I can begin to communicate.

So, posing my question to LingWear is less threatening than if I were standing in front of a hotel clerk in Heidelberg or Tokyo. In fact, it's even fun.

I'm starting to get hungry so I use LingWear to ask the imaginary German clerk: Do you have room service? LingWear's response: "Nein haben die Zimmer Saunas nicht."

What did it say? I ask Schultz.

She laughs and says, "It understood that you asked a question, but thought you asked if the hotel room had a sauna." She says that my question to LingWear proves an interesting difference between speech recognition and speech translation. "LingWear's speech recognition worked fine, but it didn't translate the meaning of what you said."

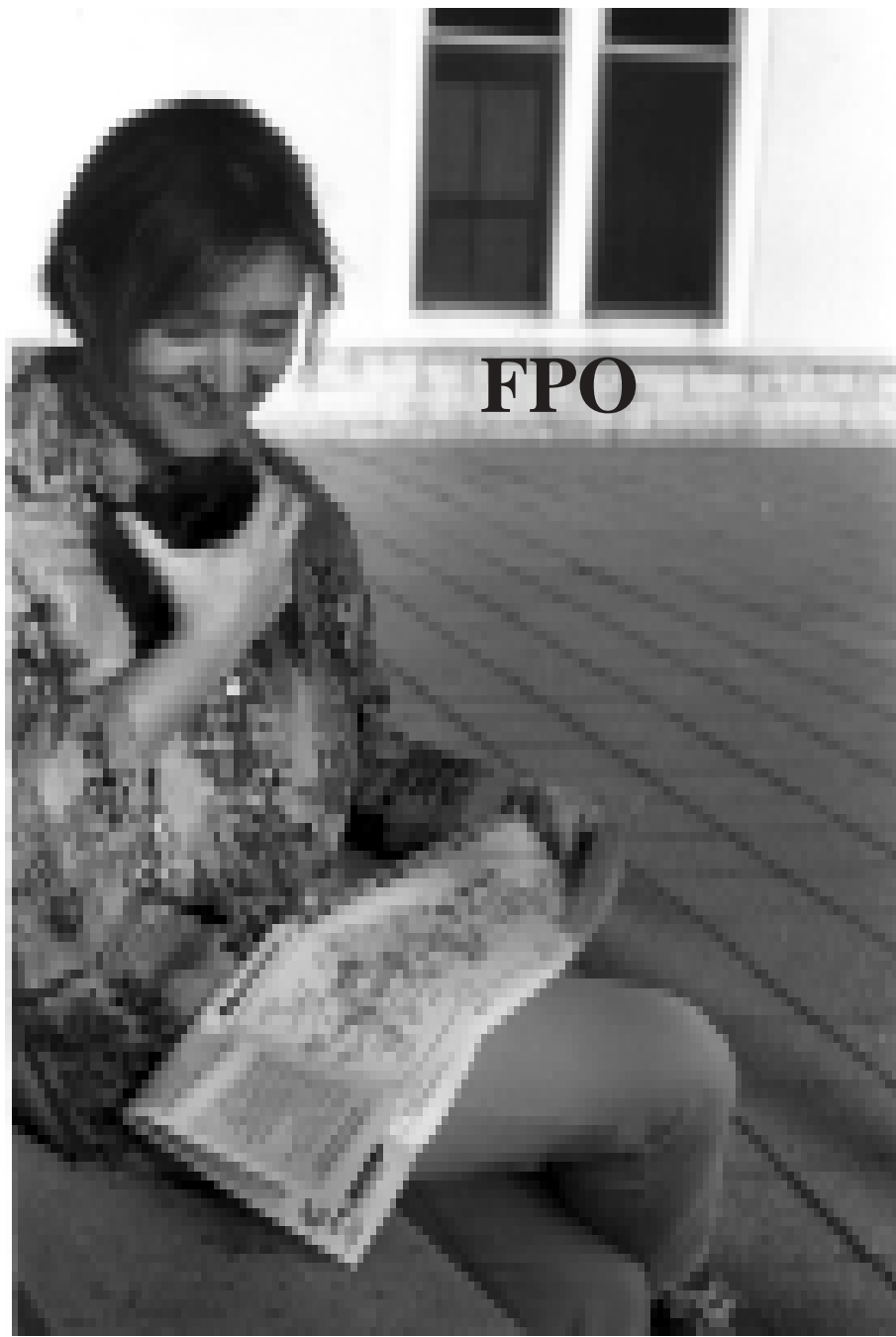
She goes on to explain that Interlingua, the part of LingWear designed to represent meaning from words, did not understand the sequence of my words either because no Interlingua existed or the wrong one was present for the translation. The result was output that did not match what I asked.

Then it hits me: If I can miscommunicate with the premier voice translation system being developed at Carnegie Mellon, I could really mess up if talking to a real person. The Interlingua did not translate the meaning of my words just as an individual from a different background and culture might not. Room service could be an American-born idea, not one that a person in a small hotel in Heidelberg would understand. Even if I had the language skills to ask the clerk about room service myself, he or she might still have misunderstood what I was asking.

Unsuccessful communication goes on every day. I say something to someone and he or she interprets it to mean something other than what I meant.

But do I ever really know that my words have miscommunicated my message? Add cultural differences to the mix, the rhetorical situation gets even more complicated.

There are many departments, offices and individuals on campus that are working to improve communication across cultures. The Language Technology Institute (LTI) is doing research to build bigger language and speech domains, to see if it's possible to create a device with unlimited domain that will cover the endless possibilities of what we can talk about, no matter the language.



Tanja Schultz gets help finding a bus from the Speechalator Photo: Brian Connelly

LingWear is a great example of the research in speech recognition and translation that LTI has so far accomplished. As Schultz says, "It focuses on something valuable that can be used as a language assistant."

Many other efforts, non-technical in nature but with the same underlying theme, are taking place to break down communication barriers on campus.

There is a yearly International Festival hosted by the President's Office, Student Affairs and Student Activities that focuses on world issues and themes in an effort to increase awareness of cultural differences and improve communications between individuals from different cultures. The festi-

vation is the Crossing Cultures Reception hosted in March as a cooperative effort between the Office of the Dean of Student Affairs and International Office of Education. Half says the goal of the reception was to promote cross-cultural interaction through deliberate activities. Activities included a question-and-answer session in which students from diverse domestic and international backgrounds talked about dining customs and holiday traditions in their families and cultures.

The reception offered the mix of American, international, graduate and undergraduate attendees "time to think about the issues affecting them and the barriers that exist,"

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val last fall was "A Celebration of Spirituality and World Religions." This coming fall the theme will be "Exploring the World Through Arts and Literature."

The goal of the festival is to break communication barriers and "bridge the gap through a different thematic approach," Emily Half, coordinator of student development in the Office of the Dean of Student Affairs says.

Another initiative to improve communi-

Half says.

Lisa Krieg, director of the office of International Education, says the reception is one of many cross-cultural training initiatives that have been offered through the years. "The reception was a super model for the future, a learning model building on the traditional strengths of student affairs," she says. The energy level was high at the event. People were actively conversing and proving that there are two ways to learn and to

acclimate oneself to another culture, Krieg says.

One is the opportunity to look at other cultures through open dialogue. The other happens in the process: As we talk about our own lives, habits and traditions we gain insight into our own culture. This leads to an understanding of how our own background shapes how we talk with and respond to others.

Communicating across cultures creates challenges at every level, Krieg says. "You have to maintain a level of vigilance and care in every single interaction you have." In addition to the language barriers, there are the other conversational elements to consider – what Krieg calls "surface issues, under the surface issues and body language issues." Great examples of this are casual social communications and the way we interact with new acquaintances in the U.S.

When I arrived at Krieg's office to talk, we shook hands and had a predictable dialogue. "How are you?" she says. "I'm great. It's a beautiful day," I say. Then we quickly discuss the weather and the great view from her office, then begin talking about why we're there in the first place.

This kind of casual first-time interaction came naturally to us. But a visitor or student studying in the U.S. would have to figure this out, just as I, traveling or studying in another country, would learn that what I consider social norms may not apply.

Seldom do I small talk about politics or religion, but in certain cultures this is the tradition. A casual greeting in some cultures includes quickly talking about politics. A big part of learning to communicate successfully across cultures is to learn what's appropriate and what's not. "There are challenges at every level," Krieg says.

These challenges are evident in an academic context as much as in a social context. Krieg explains that students who come to Carnegie Mellon face "having to communicate in many different ways at a sophisticated level both verbally and in writing." It takes time to adjust; for some, more time than others.

We have a diverse campus. Some students have grown up all over the world. Some have never left their home country before attending our university. Because of this, some find adapting to culture in the U.S. an effortless task, while others struggle for a semester or more before they feel comfortable interacting in their new environment.

To prepare students to enter another culture, Eva Mergner, study abroad and exchange advisor, hosts a pre-departure orientation in which she stresses that students should remember they are "taking their own culture with them" when they travel. One goal of the orientation is to discuss with students that they need to be aware of their own beliefs and attitudes before they can openly learn and adapt in a new culture. It's easy to see the differences between cultures on a surface level. "What you don't see are the subtle nuances that really make culture what it is," Mergner says.

It's locating and understanding the nuances in different cultures that makes studying and traveling abroad such a learning experience. It's about far more than language differences; there are styles of interacting, traditions and ways of living that we may not learn until we are immersed in another culture.

If we can discover the differences in something as simple as asking for room service or in stumbling through an awkward conversation about politics with a new acquaintance in Europe, then we're one step closer to learning to break communication barriers.

If I have LingWear on a trip overseas, my experience could go a lot more smoothly. But, if I'm on my own, with no language assistant, I'll now be aware that I've brought my own style and cultural habits of communicating to the situation. This self-awareness will help.

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