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# CMU researchers develop speech translator

By [Jennifer Bails](#)  
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Imagine saying something in English and being understood by someone who speaks only Spanish.

Carnegie Mellon University researchers and German scientists today plan to demonstrate breakthrough technology in human speech translation by computers.

The system pioneered by Alex Waibel, a faculty member at CMU and the University of Karlsruhe in Germany, could bring closer the day when communicating in a foreign language is as easy as speaking in a native tongue.

Waibel, who is also director of the International Center for Advanced Communication Technologies, will deliver a lecture that will be translated simultaneously from English to Spanish to German using the new cross-lingual communication system. The two universities will showcase the technology through an international videoconference at both campuses.

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Waibel also will demonstrate new ways of delivering computerized speech translation services beyond traditional headsets and audio equipment.

One involves an array of small ultrasound speakers that can deliver a narrow beam of sound of translated language to one person, while others nearby hear the same speech in the original language as it is spoken.

Foreign language translation also can be performed using a system that tracks and measures electrical currents on the surface of a person's cheek and throat as they mouth words instead of speaking aloud -- lip reading for the 21st century.

Electrodes attached to the face recognize muscle movement made by mouthing words and then translate and deliver sound in another language.

"In the future, such transducers could be implanted, enabling a speaker to produce any language at will," Waibel said in a statement.

Existing speech-to-speech translation systems allow for translation of spontaneous speech in limited situations, such as making hotel reservations or shopping, said Chao Wang, a research scientist at the Massachusetts Institute of Technology Computer Science and Artificial Intelligence Laboratory.

But they don't enable translation of lectures, TV broadcasts, telephone conversations or other large, open-ended forms of communication that involve complicated vocabularies and the "uhs" and "ahs" of everyday speech, said Wang, who works on computer-aided language learning systems.

Add poor grammar, mumbling and bad syntax to the mix, and speech-to-speech translation becomes a real challenge for even the best computers.

"Even for humans, it is sometimes hard to understand what we say to each other," Wang said. "For a machine, it becomes very challenging."

Jennifer Bails can be reached at [jbails@tribweb.com](mailto:jbails@tribweb.com) or (412) 320-7991.

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