

Carnegie Mellon engineering researchers to create speech recognition in silicon

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Team to develop new silicon chip

Carnegie Mellon University's Rob A. Rutenbar is leading a national research team to develop a new, efficient silicon [chip](#) that may revolutionize the way humans communicate and have a significant impact on America's homeland security.

Rutenbar, a professor of electrical and computer engineering at Carnegie Mellon, working jointly with researchers at the University of California at Berkeley received a \$1 million grant from the National Science Foundation **to move automatic speech recognition from software into hardware.**

"I can ask my cell phone to 'Call Mom,'" says Rutenbar, "but I can't dictate a detailed email complaint to my travel agent or navigate a complicated Internet database by voice alone."

The problem is power--or rather, the lack of it. It takes a very powerful desktop computer to recognize arbitrary speech. "But we can't put a PentiumTM in my cell phone, or in a soldier's helmet, or under a rock in a desert," explains Rutenbar, "the batteries wouldn't last 10 minutes."

Thus, the goal is to create a radically new and efficient silicon chip architecture that only does speech recognition, but does this 100 to 1,000 times more efficiently than a conventional computer.

The research team is uniquely poised to deliver on this ambitious

project. Carnegie Mellon researchers pioneered much of today's successful speech recognition technology. This includes the influential 'Sphinx' project, the basis for many of today's commercial speech recognizers.

"We're still not even close to having a voice interface that will let you throw away your keyboard and mouse, but this current research could help us see speech as the primary modality on cell phones and PDAs," said Richard Stern, a professor in electrical and computer engineering and the team's senior speech recognition expert. "To really throw away the keyboard, we have to go to silicon." But enhanced conversations between people and consumer products is not the main goal. "Homeland security applications are the big reason we were chosen for this award," says Rutenbar. "Imagine if an emergency responder could query a critical online database with voice alone, without returning to a vehicle, in a noisy and dangerous environment. The possibilities are endless."

Researchers plan to unveil speech-recognition chip architecture in two to three years.

Source: Carnegie Mellon University

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