Project uses smartphones to improve cochlear implants (w/ Video)

January 28 2011

(PhysOrg.com) -- Many cochlear implant users may soon be able to easily modify the settings on their hearing devices using a smartphone interface, selecting one setting for a bustling restaurant, another for a hushed library.

Ten health-care and research facilities across the U.S. are slated to participate in clinical trials of the technology, pending Food and Drug Administration approval, says Dr. Philip Loizou, director of the Cochlear Implant Lab at UT Dallas and principal investigator for the $2.5 million project, which is funded by the National Institutes of Health.

The technology, which centers on creating an interface between mobile devices and FDA-approved cochlear implants manufactured by Cochlear Ltd., replaces the speech processor that cochlear implant users wear behind the ear.

Attached to the inner ear of profoundly deaf people by an array of 16 to 22 electrodes, cochlear implants have restored partial hearing to more than 180,000 people.

Several audio-processing techniques have been developed over the years that improved the benefits derived from cochlear implants, enabling moderate levels of speech understanding today. Loizou's research focuses on developing new speech- and sound-processing strategies that further improve the levels of speech performance, particularly in noisy

environments.

“The new technology will provide a great deal of flexibility to cochlear implant users to change the programs in their device as they please and thus to optimize their listening experience in different environments,” Loizou said. “Current implant patients do not have such flexibility.”

The new technology will also enable cochlear implant users to get additional help by recording speech and other environmental sounds that they find particularly challenging.

“These real-world recordings can be brought to our lab for detailed analysis and further optimization of their device,” said Loizou, a professor of electrical engineering in the Erik Jonsson School of Engineering and Computer Science and holder of the Cecil and Ida Green Chair.

Collaborating on the project are two of Loizou’s electrical engineering colleagues, Dr. Nasser Kehtarnavaz and Dr. Hoi Lee. Researchers at Arizona State University and the University of Wisconsin-Madison are also collaborating on the clinical trials. Clinical trial sites will include Duke University, the University of Washington, Arizona State, New York University and Ohio State University.

Provided by University of Texas at Dallas