

Scientists target smartphone technology to improve hearing devices

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Many scientists agree: The smartphone offers many applications and has become one of the most sophisticated technologies out there.

With the support of a \$522,000, two-year grant from the National Institutes of Health, a UT Dallas team wants to harness the power of smartphones to help improve the quality of life of people who wear hearing assistive devices (HAD), including hearing aids, cochlear implants and personal sound amplifiers.

"Current hearing assistive devices are able to fit inside or behind the ear, but come with small, not very powerful processors to keep the device small, low power and low cost," said Dr. Issa Panahi, associate professor of electrical engineering in the Erik Jonsson School of Engineering and Computer Science and principal investigator of the research.

"On the other hand, smartphones used by billions of people have very powerful processors and other features such as large memories, microphones, speakers, wireless technology and long-lasting batteries that could aid HAD wearers."

HAD algorithms can differentiate between a limited number of noises, Panahi said. More sophisticated algorithms are needed to cover more types of background noise signals, and these algorithms for noise classification and speech enhancement require more powerful processors and additional power consumption—the capabilities that smartphones can provide.

UT Dallas researchers are especially interested in the automatic classification of various background noise signals and enhancement of both quality and intelligibility of speech signals in noisy environments and crowded places.

"Current hearing aids don't enhance speech signals optimally in an automatic manner," Panahi said. "The success of this project will open the door to the development of a wide collection of [smartphone](#) apps to be used in conjunction with [hearing aid](#) devices."

The research team also includes Dr. Nasser Kehtarnavaz, professor of [electrical engineering](#) in the Jonsson School, and Dr. Linda Thibodeau, a professor in the School of Behavioral and Brain Sciences and member of the Callier Center for Communications Disorders.

"We are lucky at UT Dallas that we have the Callier Center," Panahi said. "Not many universities have the technological, signal processing, real-time algorithm development, and engineering capabilities and experiences, as well as expertise in clinical testing and interfacing with HAD users in one place."

Provided by University of Texas at Dallas

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