Digital helpers for the hearing impaired

EurekAlert

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»Pardon me? Would you mind speaking louder, please? I can't understand you.«" About 13 million Germans cannot hear well. And it is not necessarily an issue of age. According to data from the German Association for the Deaf, roughly 19 percent of those over 14 years are hearing impaired. In the over-65 bracket, the numbers increase to every second person. Hearing abilities diminish primarily between the ages of 40 and 50. Many of those affected indicate that the impairment limits their performance at the workplace. Most diffi culties involve communication. Of particular diffi culty are telephone communications - such as via the Internet (Voice over IP). Here, the telephone conversation is conducted via computer networks using the Internet Protocol. Ambient noise and acoustic echoes often impede the conversation. For the hearing impaired, it is especially problematic. They can only use this Internet option on a very limited basis. They have to increase the volume just to be able to follow the conversation at all. But by doing so, the background noises are also intensifi ed. In any case, signal frequencies that are already loud rapidly become virtually intolerable when intensifi ed further.

In response to this, developers at the Fraunhofer Institute for Digital Media Technology IDMT in Oldenburg have come up with a digital solution. In the »Speech-Improved Telephony« project sponsored by the federal ministry for the economy and technology BMWi, they work on algorithms typically used for hearing aids that can at least partially compensate for the hearing loss. The trick: Each hearing impaired person has quite specifi c frequencies that are diffi cult for him or her. »Adjusted to the individual user, soft signals are intensifi ed while loud signals remain unchanged since they would otherwise be perceived as unpleasantly loud,« explains engineer Stefan Goetze of the Hearing, Speech and Audio Technology project group at IDMT. The system also detects background noises and reduces these to a minimum. This provides advantages not only to people who have diffi culty hearing. If a call originates from a loud environment, such as an open-plan offi ce, even persons with normal hearing can benefi t from the signal processing. The system can be set for each call in such a manner that it delivers a consistently intelligible sound pattern.

»One particular challenge is to fi gure out how users can moderate the algorithms themselves in a user-friendly manner. For seniors in particular, simple methods for making adjustments needed to be found. We were able to solve this on a test telephone through a special display. Two audio signals with different sound were visualized through fl owers. By pressing on the fl owers, the seniors can regulate the desired sound. This automatically adjusts the algorithm parameters to the hearing ability of the individual user,« explains Goetze.

The algorithms can be integrated into all audio devices. Scientists have already installed them on an iPod Touch, a telephone system, a video conferencing system and a television. The devices are currently available as demo models. »The fi rst products will probably become available in two years,« says Goetze. »If our technology is incorporated into consumer devices, then those affected will no longer have to constantly rely on their hearing aids.« The researchers will display a video conferencing system in which their algorithms are installed at this year's IFA in Berlin, the leading trade show for consumer electronics and home appliances, September 3-8 (Hall 8.1, Booth 4).

SOURCE [2]

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