

Project Group for Hearing, Speech and Audio Technology of the Fraunhofer IDMT

The Project Group for Hearing, Speech and Audio Technology of the Fraunhofer IDMT was founded in Oldenburg in August 2008 and combines the globally recognized Oldenburg hearing research with the competencies and technologies in the area of digital media developed at the Fraunhofer IDMT. As a partner in the Cluster of Excellence "Hearing4all", it is the goal of the project group to implement the scientific findings from university fundamental research in new technologies. With their research specialities, the scientists address the needs of customers in the fields of telecommunications, multimedia, health, transport and security technology.

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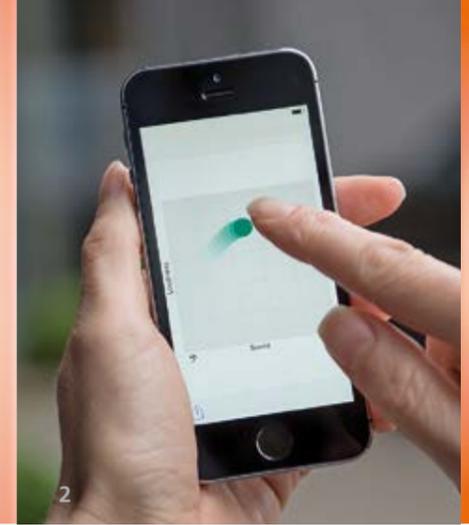
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Individual sound settings and hearing assistance on the telephone





Each person hears differently.



1 Everyone has their own auditory perception, own sound preference and own sensation of loudness. From the age of fifty onwards, normal hearing ability also deteriorates in many people. About 70 million people in Europe have a medically indicated hearing impairment. Of these, fewer than 25 percent use a hearing aid. Also see: Heger, D., & Holube, I., 2010, *Zeitschrift für Audiologie*, 49(2); Kochkin, S., 2009, *Hearing Review*, 16(11).
Picture MEV Verlag

Better speech intelligibility on the phone

Telephone calls have become an important part of our lives. Whether at work, at home or when travelling – we can now be reached everywhere. However, disturbing background noise can significantly hamper communication on the phone – particularly for those with impaired hearing. The Project for Group Hearing, Speech and Audio Technology of the Fraunhofer IDMT has developed technologies that do not just improve general sound and speech intelligibility when using the phone, but also even allow individual hearing needs to be taken into account.

Increased hearing comfort

Thanks to adaptive signal processing, each call is matched to individual hearing requirements and therefore offers significantly enhanced hearing comfort for persons both with normal and impaired hearing. Even if the telephone connection is poor, the conversation is reproduced with a uniform, easily understandable sound pattern and a pleasant volume level. This allows the call participants to concentrate on what really matters – good communication!

Phone calls without a hearing aid

Making phone calls is frequently a challenge particularly for people suffering from hearing loss. Simply increasing the volume is not enough for persons with impaired hearing. By integrating processes from hearing aid technology in phones, however, it is possible to specifically adjust the dynamic range at high or low frequencies. This makes it possible for persons with hearing impairment to better understand telephone calls even under conditions with background noise, thus allowing them to participate actively in communication again.

Ease-of-use

For individual adaptation of the telephone signal, the user selects one of the predefined hearing profiles based on his personal preferences. An audiometric measurement is not required. Selection takes place via the phone keypad, a touchscreen, or a web interface and is also possible during a call. This allows signal reproduction to be adapted quickly and easily even to difficult call conditions without interrupting the communication flow of the phone call.

Signal processing based on the latest scientific findings

Scientific findings show that persons with mild to moderate hearing loss benefit from the adaptive signal processing for better speech intelligibility. The technology allows users to better understand telephone calls with less listening effort. Volume adjustment and speech enhancement are realised by an efficient multiband dynamic compressor. Psychoacoustic auditory perception models are used in order to optimally match noise suppression to the current signal.

Integration in existing systems

The signal processing technology for hearing assistance developed at the Fraunhofer IDMT can be integrated as a software solution in telephone networks as well as in telephone systems, terminal devices and conference systems (microprocessor or DSP implementation) or in internet applications for voice or video telephony (Voice over IP).

Note: The hearing assistance software does not have the functional scope of a hearing aid and is not a medical device.

2 The Fraunhofer scientists develop signal processing methods and easy-to-use operating interfaces that allow users to adapt the audio signal to their individual hearing needs.
Picture Fraunhofer IDMT