

So That Your Colleague No Longer Sounds Like a Robot

In Herzogenrath, Hans W. Gierlich and other acoustic engineers at HEAD acoustics are researching communication technologies for mobile and home offices

During an international video conference involving Angela Merkel in April, it became clear that the Chancellor is not immune to dealing with sound and image interference. “Can you hear me now?”, she asked when she encountered the initial audio problems. Later, an Arab politician was frozen on the screen for a long period of time, and Melinda Gates from the Gates Foundation couldn’t be heard at all. For Hans W. Gierlich, Managing Director at HEAD acoustics in Herzogenrath, these are problems that could probably be solved relatively easily. The acoustics engineer deals with topics such as speech and audio quality and works for many global corporations in the telecommunications sector.

BY GUIDO M. HARTMANN

Mr. Gierlich, what is usually the problem when it comes to video or phone conferences?

HANS W. GIERLICH: Anyone who has tried having an audio or video conference in recent days or weeks knows the problems. Jerky or distorted voices, or the familiar echo effect where I hear myself twice, and my colleague sounds like a robot. The space you’re in also plays a role here. Am I sitting in a reverberant room, in a packed study, or is street noise roaring in through a partially open window? Furthermore, we are faced with technical limitations that hinder natural interaction and communication.

What are these?

These can include things like transmission delays. This makes it difficult to interrupt a participant, with the result that queries or interposed questions are often technically impossible – similar to the way walkie-talkie radios used to be.

And what can we do about it?

The ideal solution would be signal processing and transmission with extremely low latency – that’s the time it takes for the speech signal to travel from the mouth of the talker to the ear of the receiver. This means that the time for the transfer between the talker and listener should be less than 150 milliseconds. Anything that takes longer makes human communication more difficult.

How could this be improved?

In addition to the quality of the individual components, the interaction between the devices as well as the network and the conference bridge are decisive. Technology to optimize all these elements adequately is available. In principle, it does not matter whether you’re using loudspeakers on a PC, headsets, smartphones, conference telephones or speakers with voice assistants. Or whether you’re using Skype, Microsoft Teams, Zoom or one of the other platforms for the video conference. Or, for that matter, whether you’re connected via Bluetooth, Wi-Fi or something else.

Why can’t devices already do this?

Many existing standards have minimum requirements that are typically adhered to by the manufacturers of the devices. But we are now seeing that using only the basic standards is insufficient. These are certainly not satisfying.

How could this be improved?

Tests that mimic these scenarios are difficult to perform under real conditions during development. But laboratory-based solutions are available. Highly developed test procedures and simulations for laboratory use are available at our facilities in Herzogenrath, at our subsidiaries in many countries, and also at our customers' facilities. This applies to all conceivable types of equipment: cordless or wired headsets, PCs, tablets, all types of telephone, cell phones, conference systems, modems and interfaces such as Bluetooth or Wi-Fi. This means that typical conference scenarios with all their influences, as well as background noise and reverberation, can be simulated in the laboratory using state-of-the-art technology and then used in the optimization of products.

And what would it all cost?

The solution to these problems could lie in better, more accurate measurement of devices such as mobile phones, Bluetooth devices and others. This is all feasible, but it does of course involve certain additional costs. While the testing effort is admittedly multiplied, the additional cost to the consumer in the case of mass-produced products such as headsets, cell phones or PCs would probably be less than one percent of the price of the device. However, the companies would have to be prepared to include these additional costs in the budget for the development and production process. Perhaps this will become an issue at a time when audio and video conferencing is increasingly being relied upon. We have the experts for this in-house at our company, but our customers can use this measurement technology directly in their own laboratories as well.

HEAD acoustics GmbH

Ebertstraße 30a
52134 Herzogenrath
Germany

www.head-acoustics.com
info@head-acoustics.com
Tel.: +49 2407 577 0
Fax: +49 2407 577 99