DAGA 2019

March 18-21, 2019

Rostock, Germany

Reproduction of Reverberation

Hans W. Gierlich, Magnus Schäfer, Torsten Ungerechts, Benedikt Koppers, Jan Reimes, Shahd Al Hares, Christoph Nelke

Many devices that employ microphones to pick up speech signals are used in a hands-free manner. This includes, e.g., phones in hands-free mode, group-audio terminals or smart speakers with speech recognition capabilities like Amazon Echo or Google Home. Since the distance between talker and device may range from centimeters up to meters, the microphone signals contain a significant amount of noise and reverberation.

Testing of these devices requires a realistic reproduction of both the noise as well as the reverberation in a defined and reproducible manner. A background noise reproduction system is already available in ETSI TS 103 224 since 2014. An accompanying system for the reproduction of reverberation is described in the upcoming specification ETSI TS 103 557.

This contribution presents the reproduction setup along with the necessary digital signal processing for a realistic reproduction of reverberant sound fields in a measurement chamber. A head and torso simulator is utilized in conjunction with an equalized eight-loudspeaker arrangement to add reverberation to arbitrary speech signals. The capabilities of the reproduction system are illustrated by a comparison of room acoustic parameters and measurements that were done with commercially available devices both in a reverberant room and in the corresponding reproduction.

HEAD acoustics GmbH
Ebertstraße 30a
52134 Herzogenrath, Germany