PROCEEDINGS of the
23rd International Congress on Acoustics

9 to 13 September 2019 in Aachen, Germany

Assessment of acoustical properties and subjective perception in everyday life

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ABSTRACT

Hearing ability in everyday life can be determined with the method of ecological momentary assessment (EMA). For this purpose, a smartphone-based system was developed including two microphones attached to eyeglasses' temple arms on each side of the head and a bluetooth transmission. The audio signals recorded by the two microphones are analyzed in segments of 1 min and deleted immediately thereafter. By storing only averaged characteristics of the environment's acoustical properties, the privacy of the user and bystanders is fully preserved. Further offline analysis allows for own-voice detection and background estimation. The smartphone is additionally used to prompt the user approximately every half hour for subjective assessments of loudness, ability and importance of speech understanding, and listening effort with respect to the situation. 47 elderly participants used the system for several consecutive days in their individual everyday life. They spent most of their time at home. Nevertheless, mobility situations (e.g., in a car) and societal situations (e.g., in a restaurant) are important and require a higher listening effort. This contribution demonstrates the scope of this approach and gives results of acoustical properties and subjective perceptions in everyday life.

Keywords: Assessment, Real Life, Perception