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Switched Uses of a Bidirectional Microphone as a Microphone and Sensors with High Gain and Wide Frequency Range

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Abstract : Mass-produced bidirectional microphones have attractive characteristics. They work as a microphone as well as a sensor with high gain over a wide frequency range; they are also highly reliable and economical. We present novel multiple functional uses of the microphones. A mathematical model for explaining the high-pass-filtering characteristics of bidirectional microphones was presented. Based on the model, the characteristics of the microphone were investigated, and a novel use for the microphone as a sensor with a wide frequency range was presented. In this study, applications for using the microphone as a security sensor and a human biosensor were introduced. The mathematical model was validated through experiments, and the feasibility of the abovementioned applications for security monitoring and the biosignal monitoring were examined through experiments.

Keywords : bidirectional microphone, low-frequency, mathematical model, frequency response
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