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(Research Article)
Classification of the pulsed sound sources by using the combination of wavelet transform and linear prediction coefficients

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Abstract

Identify each sound source, is necessary in an acoustical field with multiple sources. In sound source identification, different techniques are used and the most important of all is based on artificial intelligent. The objective in this paper is to separate the gunshot sounds from other acoustical field sound sources. To implement the objective, a set of domestic data sets recorded inside Iran in different environmental conditions closed to real word operational situations are used to separate the gunshot sound sources from impulse environmental noise through a feature extraction technique based on wavelet transform combined with linear prediction coefficients and statistical momentum features of sound signals. Finally, different classification techniques are used on the extracted features to differentiate these gunshot sounds from other pulsed environmental noise. Also, different groups are specified to identify the sound of the sniper shot from other sounds generated by G3 and Kalashnikov rifles. The technique used in this paper has a 98.57 percent differentiation precision for separating gunshots from other pulsed sound sources via a cumulative classifier and 86.94 percent differentiation precision to separate the sound of sniper from the shot sounds of the G3 and Kalashnikov rifles.

Keywords: Impulsive noise, Shock, Feature extraction, Wavelet transform, Linear prediction coefficients, Classification.

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