Title (en)

System and method for noise reduction using a single microphone

Title (de)

Rauschverminderungsverfahren in einem Sprachsignal mit einem einzigen Mikrophon

Title (fr)

Procédé de réduction de bruit dans un signal de parole utilisant un microphone unique

Publication

EP 1081685 A2 20010307 (EN)

Application

EP 00118147 A 20000829

Priority

US 38826699 A 19990901

Abstract (en)

A noise reduction technique for use with a single microphone channel. The technique provides a noise reduction framework that allows multiple parameters to be adjusted optimally for any given application, noise environment or automatic speech recognition (ASR) system. The system of the invention includes a fast Fourier transform (FFT) circuit (10) with a bandpass filter to remove known noise frequencies from a speech signal, a speech detector (14), a noise estimator (16) that updates a noise estimate only when speech is not detected, a spectrum subtraction circuit (18) to subtract the noise estimate from the speech and noise signal spectrum, and a speech emphasis circuit (20), which further emphasizes speech signal components with respect to any residual noise. The resulting noise-reduced signals in the frequency domain can be either input directly to an automatic speech recognition (ASR) system, or transformed back to the time domain for use in a voice communication system. A noise monitor (90) may be added to the system, to determine when noise reduction is appropriate, and to avoid unwanted signal distortion when noise reduction is not needed. For further improved performance, input signals are first processed into blocks that are each used twice in forming data blocks for the FFT circuit and subsequent processing, and a triangular weighting window is applied (44) at the FFT input. <IMAGE>

IPC 1-7

G10L 21/02

IPC 8 full level

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CPC (source: EP)

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Cited by

US11308946B2; CN104978955A; CN114650484A; GB2437559A; GB2437559B; CN111724805A; CN102930870A; KR100421013B1; CN110268471A; EP3574499A4; JP2015169915A; US8615393B2; US8538749B2; WO2018140020A1; WO2016094418A1; US10045140B2; US9978388B2; US9820042B1; US9838784B2

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