Title (en)

Method for determining the boundaries of a signal mixed with background noise.

Title (de)

Verfahren zur Erfassung der Grenzen von Signalen, die vor einem Hintergrundsignalgemisch auftreten.

Title (fr)

Procédé pour déterminer les limites d'un signal mélangé à du bruit de fond.

Publication

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Application

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Priority

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Abstract (en)

1. Method for determining the boundaries of signals mixed with background noise, particularly of signal boundaries for speech processing of words spoken against a background noise, the criterion used for distinguishing between a signal of interest and the background signal or background noise being their amplitude characteristics, characterized in that - in a first step, a signal or noise recorded and subsequently preprocessed, namely an input variable (E), is observed with respect to its mean amplitude (A) and its first transmission frequency (N), referred to a reference variable (R), and its range of fluctuation (dN) within a predetermined time interval, the transmission frequency (N) being averaged from individual transmission frequencies and the range of fluctuation being determined by the maximum deviation of the individual transmission frequencies, - auxiliary variables (S1, S2, N2) are derived from the relevant variables obtained, which auxiliary variables are defined as follows : S1 = a*A+c S2 = b*A+c N2 = N/d, the variables a, b, c, d being constants which are determined by empirical values or by the type of the signal of interest, - in a second step, the current transmission frequency (N1), referred to a reference variable (R), is determined within a time pattern needed for adequate resolution, - one of the previously derived auxiliary variables (S1 or S2) is allocated to a weighting variable (S) in dependence on the observed derived transmission frequency (N2) with its range of fluctuation (dN) and the current transmission frequency (N1), - the current input variable (E) is measured by means of this weighting variable (S), - an operating (O1) dependent on the position of the input variable (E) relative to the weighting variable (S) is performed, - two boundary values (UG, OG1) are determined on the basis of the type of the signal of interest, - the result of the operation (O1) is limited towards the bottom by the first limit value (UG), - the existence of a signal of interest is detected when the second upper limit value (OG1) is reached, - the precise beginning of the signal (SB) is in front of the relevant detection time (ZE1) by a defined time interval, - in a third step, the position of the input variable (E) relative to the weighting variable (S) is evaluated by a further operation (O2) in such a manner that the non-existence of the signal of interest detected in the second step is established using a second limid value (OG2) which has been previously determined on the basis of the type of the signal of interest, the further operation being defined as follows : O2 = 02+1 for ¦E¦ < S O2 = O in all other cases or OG2 in all other cases or O2 - 1 for ¦E¦ < S, - and the precise signal end (SE) is in front of the relevant detection time (ZE2) by a defined time interval.

Abstract (de)

Ein Verfahren zur Erfassung der Grenzen von Signalen, die vor einem Hintergrundsignalgemisch auftreten bei dem als Unterscheidungskriterium zwischen einem interessierenden Signal und dem Hintergrundsignal oder Hintergrundsignalgemisch deren Amplitudenverhalten herangezogen wird, wozu eine Eingangsgröße (E) hinsichtlich ihrer mittleren Amplitude (A) und ihrer auf eine Referenzgröße bezogenen ersten Durchgangshäufigkeit und deren Schwankungsbreite (dN) innerhalb eines vorgegebenen Zeitintervalls beobachtet wird, wobei die Durchgangshäufigkeit aus Einzeldurchgangshäufigkeiten gemittelt wird und wobei die Schwankungsbreite durch die maximale Abweichung der Einzeldurchgangshäufigkeiten bestimmt ist, wozu aus den betreffenden gewonnenen Größen Hilfsgrößen (S1, S2, N2) abgeleitet werden, wozu eine der zuvor abgeleiteten Hilfsgrößen (S1 oder S2) einer Bewertungsgröße zugeordnet wird, wozu anhand dieser Bewertungsgröße die aktuelle Eingangsgröße (E) gemessen wird, wozu aufgrund der Art des interessierenden Signals zwei Grenzwerte festgelegt werden, wozu bei Erreichen des oberen Grenzwertes das Vorhandensein eines interessierenden Signals erkannt wird und wozu bei Erreichen eines weiteren, aufgrund der Art des interessierenden Signals zuvor festgelegten Grenzwertes das Nichtvorhandensein des erfaßten interessierenden Signals festgestellt wird.

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CPC (source: EP)

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