

Title (en)

Sound field control in multiple listening regions

Title (de)

Schallfeldsteuerung mit mehreren Hörbereichen

Title (fr)

Contrôle de champ sonore dans plusieurs régions d'écoute

Publication

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Application

EP 09007142 A 20090528

Priority

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Abstract (en)

[origin: EP2257083A1] The invention provides a scheme to design an audio precompensation controller for a multichannel audio system, with a prescribed number N of loudspeakers in prescribed positions so that listeners positioned in any of P>1 spatially extended listening regions should be given the illusion of being in another acoustic environments that has L sound sources (virtual loudspeakers) located at prescribed positions in a prescribed room acoustics. The invention provides a unified joint solution to the problems of equalizer design, crossover design, delay and level calibration, sum-response optimization and up-mixing. A multi-input multi-output audio precompensation controller is designed for an associated sound generating system comprising a limited number of loudspeaker inputs for emulating a number of virtual sound sources. The scheme for designing is based on: (S1) estimating, for each loudspeaker input signals, an impulse response at each of a set of measurement positions that cover the P listening regions; (S2) specifying a target impulse response (target stages) for each virtual sound source at each measurement position; and (S3) determining adjustable filter parameters of the audio precompensation controller so that a criterion function is optimized. The criterion function includes a weighted summation of powers of differences between the compensated estimated impulse responses and the target impulse responses over a discrete grid of said M measurement positions. This optimization can furthermore be iterated with a tuning of adjustable parameters in the target stages to improve the attainable criterion value and the accuracy of the compensation.

IPC 8 full level

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Cited by

WO2013141768A1; ES2751224A1; CN114827837A; EP2806663A1; FR3118264A1; JP2017212558A; CN117651238A; EP4040810A1; FR3119723A1; CN104186001A; KR20140138972A; EP2692155A4; US11800309B2; US9591420B2; US11246000B2; WO2014150598A1; WO2021053253A1; WO2020256612A1; WO2013149867A1; US9781510B2

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