

Sound Processing Improves Audibility of Music/Speech in fMRI

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Overview

Noise produced by functional MRI impedes the audibility of music and speech while causing distraction. When studies of auditory stimuli are performed or the patient needs to hear spoken information, this noise can compromise the value, accuracy, and convenience of fMRI studies.

Current approaches to noise mitigation involve hardware-intensive solutions such as active phase cancellation.

Invention

A new approach measures the frequency components across the acoustic power spectrum emitted by the MRI device. This can be done manually or automatically, and either during the MRI procedure or in advance.

Processing can be applied to digitally recorded or live audio. A parametric equalizer increases frequency components in proportion to the acoustic power spectrum measurements taken from the MRI equipment.

Further processing includes attenuation of overall level to prevent over-modulation, dynamic range compression, and increasing gain to improve audibility. When real-time processing is applied to spoken questions and instructions, communication improves between the patient and the MRI operator.

Advantages

- Used as a pre-processing algorithm compatible with commercial audio editing software
- As a plug in for audio software
- Combined use of audio analysis and processing with active phase cancellation technology may yield results unobtainable by either method alone

Applications

- fMRI equipment manufacturers
- Companies producing products for speech and music communication

I.P. Status

US Patent Application Filed

Learn more about Dr. Mantegna's research at:
<http://bit.ly/ldwvWO>

For more information and licensing opportunities,
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