INVESTIGATING A MODEL FOR MUSIC COMPLEXITY APPLIED TO MUSIC PREPROCESSING FOR COCHLEAR IMPLANTS

Wim Buyens[1 2 3], Marc Moonen[2], Jan Wouters[3], Bas van Dijk[1]

[1]Cochlear Technology Centre Belgium, Mechelen, Belgium
[2]KU Leuven - University of Leuven, Department of Electrical Engineering (ESAT-STADIUS), Leuven, Belgium
[3]KU Leuven - University of Leuven, Department of Neurosciences (ExpORL), Leuven, Belgium

Music appreciation in cochlear implant (CI) users is generally poor. A strong negative correlation between music complexity and music appreciation was found for CI subjects, i.e. music that was rated less complex, was appreciated more. The effect of complexity reduction on music appreciation was studied with a music preprocessing scheme in which the vocal melody was extracted together with bass/drums, whereas the other instruments were removed or attenuated with an adjustable attenuation parameter (Buyens et al, 2015). In the evaluation of the music preprocessing scheme with CI subjects, a positive correlation was found between the (subjective) music complexity and the preferred attenuation parameter, i.e. with more complex music, the preferred attenuation applied to the other instruments was larger. Based on these findings, it was anticipated that a model for music complexity might give an indication for the preferred attenuation parameter setting. The investigation of music complexity is divided in three parts.

First, a complexity rating experiment with pop/rock music excerpts is summarized and discussed. Fifty song excerpts were played in random order and normal hearing (NH) test subjects were asked to rate the music complexity of the song on a scale from 1 to 100 with a slider in a graphical user interface on a laptop.

Second, different music features are extracted from the pop/rock song excerpts to describe the characteristics of the songs. A linear regression model is developed to describe the (subjective) music complexity by combining the different music features with the results from the complexity rating experiment in the first part.

Finally, the evaluation of the music preprocessing scheme with CI subjects is discussed. The complexity reduction with music preprocessing is validated objectively based on the music complexity model, and an indication for the preferred adjustable parameter setting is proposed.

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