SHORT NOTE

A note on the letter “Improved method to individualize head-related transfer function using anthropometric measurements” (Vol. 29, 2008: 388–390)

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In our letter “Improved method to individualize head-related transfer function using anthropometric measurements”, which was published in *Acoustical Science & Technology* (Vol. 29, 2008: 388–390) [1], we proposed the use of position-specific basis functions in head-related transfer function (HRTF) individualization on the basis of listeners’ anthropometric measurements and provided a statistical test proving that the improved method could significantly reduce spectral distortion at the selected positions. This method was referred to as a “new” method in the letter. Here, we must clarify that the position-specific method is not a novel method because it has been used in other studies by Inoue *et al.* [2] and Nishino *et al.* [3], although the existing publications do not emphasize the use of position-specific basis functions.

Inoue *et al.* [2] and Nishino *et al.* [3] focused on “a simpler and more useful method that investigates the relationship between HRTFs and physical size by multiple regression analysis.” A Japanese HRTF database (86 subjects, 9 physical measurements) was analyzed. Their multiple regression method was adopted in our study, but our purpose was to examine the necessity of adopting position-specific basis functions, by modeling and analyzing the CIPIC (Center for Image Processing and Integrated Computing) database (45 subjects, 27 physical measurements), which is public and contains a large amount of physical measurement data [4].

In our letter, we hypothesize that the methods of establishing the basis functions (dependent on or independent of positions), which are used to reconstruct HRTFs in the HRTF model based on principal components analysis (PCA) and minimum-phase reconstruction [5], significantly affect the spectral distortions of the model. Then, a statistical analysis was performed to test the hypothesis, and significant differences in the spectral distortions were found. Thus, our contribution is unique, but our statement that we developed a “new” improved method in the letter is misleading, because the readers may mistakenly conclude that we were the first ones to use the position-specific method. Actually, we proposed the use of the position-specific method and provided statistical evidence of its necessity.

The Japanese HRTF database that was studied by Inoue *et al.* [2] and Nishino *et al.* [3] contains data of nine physical features. In contrast, the CIPIC database we studied includes data of 27 physical measurements. The key measurements we adopted were identified by our weighted correlation method proposed in [6]. Following Dr. Nishino’s suggestion, we are now studying the influence of the number of physical features on estimation performance.

References

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