Techniques to Characterize Subpopulations among Hearing Impaired Patients and Its Impact for Hearing Aid Fitting

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Abstract : BEAR, which stands for better hearing rehabilitation is a large-scale project in Denmark designed and executed by three national universities, three hospitals, and the hearing aid industry with the aim to improve hearing aid fitting. A total of 1963 hearing impaired people were included and were segmented into subgroups based on hearing-loss, demographics, audiological and questionnaires data (i.e., the speech, spatial and qualities of hearing scale [SSQ-12] and the International Outcome Inventory for Hearing-Aids [IOI-HA]). With the aim to provide a better hearing-aid fit to individual patients, we applied modern machine learning techniques with traditional audiograms rule-based systems. Results show that age, speech discrimination scores, and audiogram configurations were evolved as important parameters in characterizing sub-population from the data-set. The attempt to characterize sub-population reveal a clearer picture about the individual hearing difficulties encountered and the benefits derived from more individualized hearing aids.