D. S. Chaudhari and P. C. Pandey, Critical filter based speech signal processing for persons with bilateral sensorineural hearing impairment, J. Institution of Engineers (India), vol. 82, pp. 11-15, 2001

Contact: Prof. P. C. Pandey
Department of Electrical Engineering,
Indian Institute of Technology Bombay, Powai, Mumbai.
mailto: pcpandey@ee.iitb.ac.in

Abstract - **One of the major factors in degraded speech reception by persons with sensorineural hearing loss is the reduced frequency selectivity along the cochlear partition in the ear. Speech signal processing using a filter bank based on critical bands (corresponding to auditory filters) and presenting signals from alternate bands) in such a way that signals corresponding to odd numbered bands are presented to one ear and even numbered are presented to other is likely to reduce this effect. This may help in improving speech perception. The processing scheme was implemented using 18 critical bands over a 5 kHz frequency range. For experimental evaluation, the listening test material consisted of nonsense syllables formed with 12 english consonants and vowel /a/ in vowel-consonant-vowel and consonant-vowel contexts. The scheme was tested on ten sensorineural hearing-impaired subjects. It resulted in improvement in percieved speech quality, response time, recognition score and information transmission of consonantal place feature, signifying the usefulness of the scheme for better reception of spectral characteristics. The scheme may be employed in binaural hearing aids for persons with moderate bilateral sensorineural loss.**