**A NEW METHOD FOR MONAURAL SPEECH SEPARATION USING IBM**

**Abstract**

The human auditory system is an acoustic and cognitive wonder, which has the ability to separate the target speech from the acoustic mixture. The acoustic mixture may be another speech or environmental noise or both. This has lot of requirements in the field of multimedia applications. Hence, researchers are trying to build a computer model of high-level functions of the auditory system. Computational Auditory Scene Analysis (CASA) has been introduced recently to separate the target speech from the acoustic mixture based on the principles of human auditory system.

The Ideal Binary Mask (IBM) is the goal of CASA algorithms. The IBM is a binary mask, in which 1 indicates the speech dominant T-F unit and 0 indicates the noise dominant T-F unit. Weintraub (1985) has proposed a Gammatone analysis and synthesis filter bank to model the cochlea of the human auditory system and compute the IBM. Since then this successful model has been used in most of the speech separation systems. In the above model, the computed IBM will be multiplied with the synthesized speech signal on a later stage. This approach involves many unnecessary computations since most of the frames will have zero values corresponding to the noise dominant T-F units without contributing to the final output.

This project work aims to propose a new Gammatone analysis and synthesis filter bank model for speech separation. In this proposed model, the computed IBM will be multiplied before synthesizing the speech signal. Since many frames have zero values, the synthesis filter bank processes these frames with minimal computational delay and hence the throughput of the overall system can be increased without compromising on the quality and intelligibility of the speech signal.

**Keywords:** Monaural speech separation - Computational Auditory Scene Analysis (CASA) - Ideal Binary Mask (IBM) – Gammatone Filter Bank

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