

Applying the Generalized Dombi Operator Family to the Speech Recognition Task

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Abstract. In the automatic speech recognition (ASR) problem, the task of constructing one word- or sentence-level probability from the available phoneme-level probabilities is a very important one. Here we try to improve the performance of ASR systems by applying operators taken from fuzzy logic which have the sort of properties this problem requires. In this paper we do this by using the Generalized Dombi Operator, which, by its two adjustable parameters and incorporating other well-known fuzzy operators, seems quite suitable. To properly adjust these parameters, we used the public optimization package called Snobfit. The results show that our approach is surprisingly successful: we were able to reduce the error rate by 53.4%.

KeyWords: speech recognition, triangular norms, Dombi t-norm family, probability calculation