

DeMorgan Class and Negation

József Dombi

July 4, 2007

Abstract

The study in this paper is a theoretical inquiry into new representation of negation operators.

New fuzzy negation operator family is proposed, which is based on theoretical investigation. Using new negation new t-norm and t-conorm can be formed too.

Our starting point is the necessity and sufficient condition of the DeMorgan law. On the basis of this result we establish a new condition of negation. We show that the well-known negations can be derived by using the representation theorem.

The famous result of Trillas on negation gives a representation theory too. The generator function of the negation corresponds the nilpotent class of t-norms and t-conorms. Our result is the representation theorem of negation in case of strict t-norm and t-conorm. From this investigation we get the theoretical background of Roychowdhury's result and it is generalized too.

Keywords: Fuzzy sets, complement, t-norm, t-conorm