

# Novel Fuzzy Reasoning Algorithm based on Semi-overlap Function

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**Abstract** Fuzzy Modus Ponens (FMP) is a fundamental pattern of approximate reasoning. Zadeh introduces the well-known Compositional Rule of Inference (CRI), Wang argues that the use of the compositional operation is logically not sufficiently justified and proposes the Triple Implication Principle (TIP) instead, Zhou et al propose the Quintuple Implication Principle (QIP) for fuzzy reasoning based upon Monoidal t-norm Logic (MTL). On the basis of these researches, we discuss new reasoning algorithm in a more general framework. Firstly, the concept of semi-overlap function, which is the common extension of overlap function and left continuous t-norm, is proposed. Secondly, according to the Quintuple Implication Principle (QIP), a new fuzzy reasoning algorithm based on semi-overlapping function and residuated implication is proposed. Finally, some applications of the new fuzzy reasoning algorithm are given.