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Equivalence Connective in many-valued Logics and Generalizing the Metric Concept

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Many-valued logics extend classical logic by allowing truth values beyond "true" (1) and "false" (0), typically within a continuum like [0, 1]. They model uncertainty, vagueness, and partial truth. T-norm based logics, a subclass of many-valued logics, interpret logical conjunction by an algebraic concept, t-norm. Within this framework, the semantics of all connectives are rigorously defined by t-norms and their residual implications.

In this talk, we investigate a duality between the interpretation of the equivalence connective in manyvalued logics and metric function. We demonstrate how this duality enables novel distance-based reasoning in fuzzy logical systems and how it can generalize the metric concept.