

Abstract

This work introduces some very basic concepts of category theory as built up over first-order predicate Gödel fuzzy logic (with crisp identity and the delta operator). A fuzzy variation of a classical concept of a category is considered. Then several systems of morphisms loosely based on the crisp categories Rel and Set are defined and examined. Accordingly, all the systems under consideration consist of fuzzy sets as objects and various kinds of binary fuzzy relations as morphisms. Our approach is a logic-based graded generalization of crisp (classical) category-theoretical approaches to fuzzy sets, which have been initiated by Goguen.