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Fixed points of generalized contractions on intuitionistic fuzzy metric spaces

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Abstract

In this paper, we introduce a new concept of generalized contraction on intuitionistic fuzzy metric spaces and give fixed point results for these classes of contractions.

Keywords: Intuitionistic fuzzy metric space, Generalized contractive mapping, Fixed point.
Mathematics Subject Classification [2010]: 47H10

1 Introduction

Kramosil and Michalek introduced the notion of fuzzy metric spaces [4] and George and Veeramani modified the concept in 1994 [2] in order to obtain a Hausdorff topology in fuzzy metric spaces. In 2014, Park introduced the notion of intuitionistic fuzzy metric spaces [5], and he showed that the topology generated by the intuitionistic fuzzy metric (M, N) coincides with the topology generated by the fuzzy metric M. In [6] Wardowski introduced a new concept of a fuzzy $\mathcal{H}$-contractive mappings and formulated the conditions guaranteeing the convergence of a fuzzy $\mathcal{H}$-contractive sequence to a unique fixed point in a fuzzy M-complete metric space. Recently, Amini-Harandi [1] introduced a new concept of fuzzy generalized contractions as a generalization of the fuzzy $\mathcal{H}$-contractive, by replacing the constant k by a function α and then gave a fixed point result for such mappings in the setting of fuzzy M-complete metric spaces. He also gave an affirmative partial answer to a question posed by Wardowski. In the present paper, we introduce some new classes of generalized contractions in a complete intuitionistic fuzzy metric spaces and give fixed point results for them. Our new result generalized some results obtained by Ionescu et al [3] in the setting of complete intuitionistic fuzzy metric spaces.

Definition 1.1. [5] A 5-tuple $(X, M, N, *, \diamond)$ is said to be an intuitionistic fuzzy metric space if X is an arbitary set, $*$ a continuous t-norm, $\diamond$ a continuous t-conorm and M, N are fuzzy sets on $X^2 \times [0, \infty)$ satisfying the following conditions:for all $x, y, z \in X, s, t > 0$,

(a) $M(x, y, t) + N(x, y, t) \leq 1$;

(b) $M(x, y, 0) = 0$;

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