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Review Paper on "Fixed Point Theorems in Intuitionistic Fuzzy Metric Space"

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"ABSTRACT"

"In this review paper, we studied various research papers on fixed point theory in intuitionistic fuzzy metric spaces. Lots of the theorems were proved for the existence of common fixed points in fuzzy metric spaces."

1. "INTRODUCTION":

The concept of fuzzy sets is introduced by Zadeh [19]. In 1975, Kramosil & Michlek [7] introduced the concept of Fuzzy sets,Fuzzy metric spaces.George & Veeramani [5] gave the modified version of Fuzzy metric spaces continuous t norms.In 2005, Park, Kwun, and Park [15] proved some theorems in intuitionistic fuzzy metric spaces. In 1986, Jungck [6] introduced the concept of compatible mappings. Aamri and Moutawakil [1] introduced the concept of non compatibility using E.A property and proved several fixed point theorems under contractive conditions. Atanassove [3] introduced the concept of Intuitionistic fuzzy sets which is a generalization of fuzzy sets. In 2004, Park [14] defined Intuitionistic Fuzzy metric spaces using t-norms & t- conorms as a generalization of fuzzy metric spaces. Turkoglu [18] generalized Jungck common fixed point theorem to Intuitionistic Fuzzy metric spaces. E.A property in Intuitionistic Fuzzy metric spaces is used to prove fixed point theorems for a pair of fixed maps. S.Kumar, S.S.Bhatia, S.Manro [8] proved a common fixed point theorem for weakly mappings satisfying E.A property in Intuitionistic Fuzzy metric spaces using Implicit relation. Fixed point theorems for weakly compatible mappings satisfy E.A property in Intuitionistic Fuzzy metric spaces.

2. PRELIMINARIES

2.1 : COUNTRY OF RESEARCH :

S.NO	AUTHOR	TITLE OF THE PAPER	YEAR	COUNTRY
1.	"Yasmeen Bano1, Geeta Modi and R.S. Chandel"	"Common Fixed Point Theorem in Intuitionistic Fuzzy Metric Space Using Strict Contractive Conditions"	"2012"	"INDIA"
2.	Mohammad Tanveer, Mohammad Imdad, Dhananjay Gopal and Deepesh Kumar Patel	"Common fixed point theorems in modified intuitionistic fuzzy metric spaces with common property (E.A.)"	"2012"	"INDIA"
3.	"M.Imdada,Javid Ali,M.Hasan"	"Common fixed point theorems in fuzzy metric spaces employing common property (E.A.)"	"2012"	"INDIA"
4.	"Jitendera Airan , Geeta Modi"	"Fixed Points in Intutionistic Fuzzy Metric Spaces for Weakly Compatible Maps"	"2012"	"INDIA"
5.	"M.Imdada,Javid Ali,M.Hasan"	"Common Fixed point theorem in intuitionistic fuzzy metric space"	"2012"	"INDIA"
6.	"Cristiana Ionescu,Shahram Rezapour andMohamad Esmaeil Samei"	"Fixed points of some new contractions on intuitionistic fuzzy metric spaces"	"2013"	"IRAN"
7.	"Syed Shahnawaz Ali , Dr. Jainendra Jain, Dr. Anil Rajput"	"A Fixed Point Theorem in Modified Intuitionistic Fuzzy Metric Spaces"	"2013"	"INDIA"
8.	"M.S. Chauhan, Dheeraj Aheere, Bharat Singh"	"Fixed point Theorem in Intuitionistic Fuzzy metric space"	"2013"	"INDIA"
9.	"Mohammad Hasan, Ramadan Sabra"	"Common Fixed point theorem in intuitionistic fuzzy metric space"	"2014"	"SAUDI-ARABIA"
10**.**	"Sunny Chauhan, Wasfi Shatanawi, Suneel Kumar, Stojan Radenovic"	"Existence and uniqueness of fixed points in modified intuitionistic fuzzy metric spaces"	"2014"	"INDIA"

11.	"Shams-ur-rahman, M. I. Bhatti, Fakhar Haider, Muhammad Yar Baig and Shabana Azam"	"Fixed point theorem in intuitionistic fuzzy metric space"	"2014"	"PAKISTAN"
12.	"Ismat Bega, Calogero Vetrob, Dhananjay Gopal and Mohammad Imdad"	"(φ,ψ)−weak contractions in intuitionistic fuzzy metric spaces"	"2014"	"PAKISTAN" ,"INDIA", "ITALY"
13.	"N.Hussain, S.Khaleghizadeh,P. Salimi and Afrah A.N.Abdou"	"A New Approach to Fixed Point Results in Triangular Intuitionistic Fuzzy Metric Spaces"	"2014"	"SAUDI-ARABIA", "IRAN"
14.	"S.Melliani, M.Elomari, L.S.Chadli and R.Ettoussi"	"Intuitionistic fuzzy metric space"	"2015"	"MOROCCO"
15.	"V. Malliga Devi, R.Mohan Raj and M.Jeyaraman"	"Common Fixed point theorem in intuitionistic fuzzy metric space"	"2016"	"INDIA"
16.	"M. Jeyaraman and M. Barveen Banu"	"Fixed point theorem in intuitionistic fuzzy metric spaceusing(CLRg)property"	"2016"	"INDIA"
17.	"Nidhi Verma , Dr.Rajesh Shrivastava"	"A Fixed point theorem in Non Archimedean intuitionistic Fuzzy 3 Metric Spaces"	"2017"	"INDIA"
18.	"Piyush Kumar Tripathi ,Sajjan Lal Maurya , Neelam Yadav"	"Coincidences and Common Fixed-Point Theorems in Intuitionistic Fuzzy Metric Space"	"2017"	"INDIA"
19.	"Akhilesh Jain, Chandel R.S., Hasan Abbas and Uday Dolas"	"Common Fixed point theorem in intuitionistic fuzzy metric space under strict contractive conditions"	"2018"	"INDIA"
20.	"Saurabh Manro, and Anita Tomar"	"Coincidence and Common Fixed Point of Weakly Compatible Maps in Intuitionistic Fuzzy Metric Space"	"2018"	"INDIA"

2.2 : "TOPIC"

"COMMON FIXED POINT THEOREMS IN AN INTUITIONISTIC FUZZY METRIC SPACES"

2.3: "RESEARCH WORK"

"RESEARCH WORK IN 2012"

S.NO	"OBJECTIVES"	"METHODOLOGY"
1.	"To obtain a common fixed point theorem in an intuitionistic fuzzy metric space under strict contractive conditions"	"Strict contractive conditions in intuitionistic fuzzy metric space"
2.	"Some common fixed point theorems in modified intuitionistic fuzzy metric spaces satisfying an implicit relation is introduced."	"Notions of the property (E.A.) and common property (E. A.) in the setting of modified intuitionistic fuzzy metric spaces"
3.	"To Generalize and extend several relevant common fixed point theorems "	"The property (E.A.) and the common property (E.A.) to prove some existence results on common fixed point for contractive mappings in fuzzy metric spaces"
4.	"Some fixed point theorems for weakly compatible maps in Intutionistic Fuzzy metric space are established."	"Without assuming the completeness of the space or continuity of mapping involved"
5.	"A new class of implicit functions and also common property (E.A) in modified intuitionistic fuzzy metric spaces is introduced and by utilizing the same author proved some common fixed point theorems in modified intuitionistic fuzzy metric spaces."	"Implicit functions and (E.A) property in intuitionistic fuzzy metric space"

"RESEARCH WORK IN 2013"

S.NO	"OBJECTIVES"	"METHODOLOGY"
1.	"Some new contractions on intuitionistic fuzzy metric spaces and a stability result is established"	"Continuous t-norm , induced topology, contractive conditions"
2.	"A common fixed point theorem for a sequence of mappings in an intuitionistic fuzzy metric space is	"Continuous t-norm, triangular norm , 3-tuple, Cauchy sequence"

	introduced"	
3.	"To generalize fuzzy metric space in term of fixed point theorem in modified Intuitionistic fuzzy metric space"	"Weakly compatible mapping along with property (CLRS) and (CLRT)."

"RESEARCH WORK IN 2014"

S.NO	"OBJECTIVES"	"METHODOLOGY"
1.	"A new class of implicit functions and common property (E.A) in intuitionistic fuzzy metric spaces is introduced and by utilizing both common fixed point theorems in intuitionistic fuzzy metric spaces are proved."	"Implicit functions and common (E.A) Property"
2.	"An integral type common fixed point theorems for two pairs of weakly compatible mappings satisfying φ-contractive conditions in modified intuitionistic fuzzy metric spaces are proved."	"The concept of common limit range property"
3.	"To Generalize fuzzy metric space in term of fixed point theorem in Intuitionistic fuzzy metric space."	"Contraction mapping , Banach Fixed Point Theorem"
4.	"To extend the notion of (φ,ψ)−weak contraction to intuitionistic fuzzy metric spaces."	"An altering distance function"
5.	"To propose some fixed point theorems in complete parametric metric spaces and also proved certain fixed point theorems in triangular intuitionistic fuzzy metric spaces."	"Complete Parametric Metric Space ,Self Mapping ,Banach Contraction Principle"

"RESEARCH WORK IN 2015"

S.NO	"OBJECTIVES"	"METHODOLOGY"

1.	"To propose a method for constructing a Hausdorff intuitionistic fuzzy metric on the set of the nonempty compact subsets of a given intuitionistic fuzzy metric space"	"Topology, Baire's Theorem,Convex and Concave Fuzzy,Triangular intuitionistic Fuzzy number"

"RESEARCH WORK IN 2016"

S.NO	**"OBJECTIVES"**	**"METHODOLOGY"**
1.	"To prove common fixed point theorems for compatible mappings in complete intuitionistic fuzzy metric spaces."	"compatible mappings,complete intuitionistic fuzzy metric space."
2.	"To prove common fixed point for four self-mappings that are compatible in an intuitionistic fuzzy metric space."	"Common Limit in Range of G (CLRg), compatible mappings"

"RESEARCH WORK IN 2017"

S.NO	**"OBJECTIVES"**	**"METHODOLOGY"**
1.	"To generalize and extend some recent results for non Archimedean intuitionistic fuzzy 3 metric spaces."	"Commuting maps, Archimedean fuzzy metric space"
2.	"To improve the results of Turkoglu, Alaca, Cho and Yildiz in intuitionistic fuzzy metric space by not using the continuity of the function."	"By using coincidently commuting mappings and without using continuity of mappings."

"RESEARCH WORK IN 2018"

S.NO	**"OBJECTIVES"**	**"METHODOLOGY"**

1.	"To prove the common fixed point theorem in intutionistic fuzzy metric space under strict contrac tive conditions."	"Intuitionistic Fuzzy sets, continuous t-norms and continuous t-conorms, Cauchy sequences"
2.	"To guarantee the existence of coincidence and common fixed point for noncompatible maps without closedness /completeness requirement of subspace even when all the maps are discontinuous."	"common limit in the range property (CLRfg), weakly compatible self map, property (E.A)"

2.4 : ANALYSIS OF RESEARCH WORK :

"YEAR"	"ANALYSIS"
"2012"	"Strict contractive conditions, Property (E.A.),Contractive mappings are used to prove the common fixed point theorems in intuitionistic fuzzy metric spaces."
"2013"	"Continuous t-norm , induced topology, contractive conditions, triangular norm , 3-tuple, Cauchy sequence, Weakly compatible mapping along with property (CLRS) and (CLRT) are used to prove the common fixed point theorems in intuitionistic fuzzy metric spaces."
"2014"	"Implicit functions , common (E.A) Property, The concept of common limit range property, Contraction mapping , Banach Fixed Point Theorem, An altering distance function, Complete Parametric Metric Space ,Self Mapping ,Banach Contraction Principle are used to prove the common fixed point theorems in intuitionistic fuzzy metric spaces."
"2015"	"Topology, Baire's Theorem,Convex and Concave Fuzzy,Triangular intuitionistic Fuzzy number are used to prove the common fixed point theorems in intuitionistic fuzzy metric spaces."
"2016"	"Common Limit in Range of G (CLRg), compatible mappings , compatible mappings,complete intuitionistic fuzzy metric space are used to prove the common fixed point theorems in intuitionistic fuzzy metric spaces."
"2017"	"Commuting maps, Archimedean fuzzy metric space , By using coincidently commuting mappings and without using continuity of mappings are used to prove the common fixed point theorems in intuitionistic fuzzy metric spaces."

"2018"	"Intuitionistic Fuzzy sets, continuous t-norms and continuous t-conorms, Cauchy sequences , common limit in the range property (CLRfg), weakly compatible self map, property (E.A) are used to prove the common fixed point theorems in intuitionistic fuzzy metric spaces."

2.5: FINDINGS :

"Different methods are used to prove the common fixed point theorems in an intuitionistic fuzzy metric spaces."

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