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DVV CLARIFICATION

Criterion 3: Research, Innovations and Extension

Key Indicator 3.3- Research Publication and Awards

Metric Number: 3.3.2

A.Y.-2023

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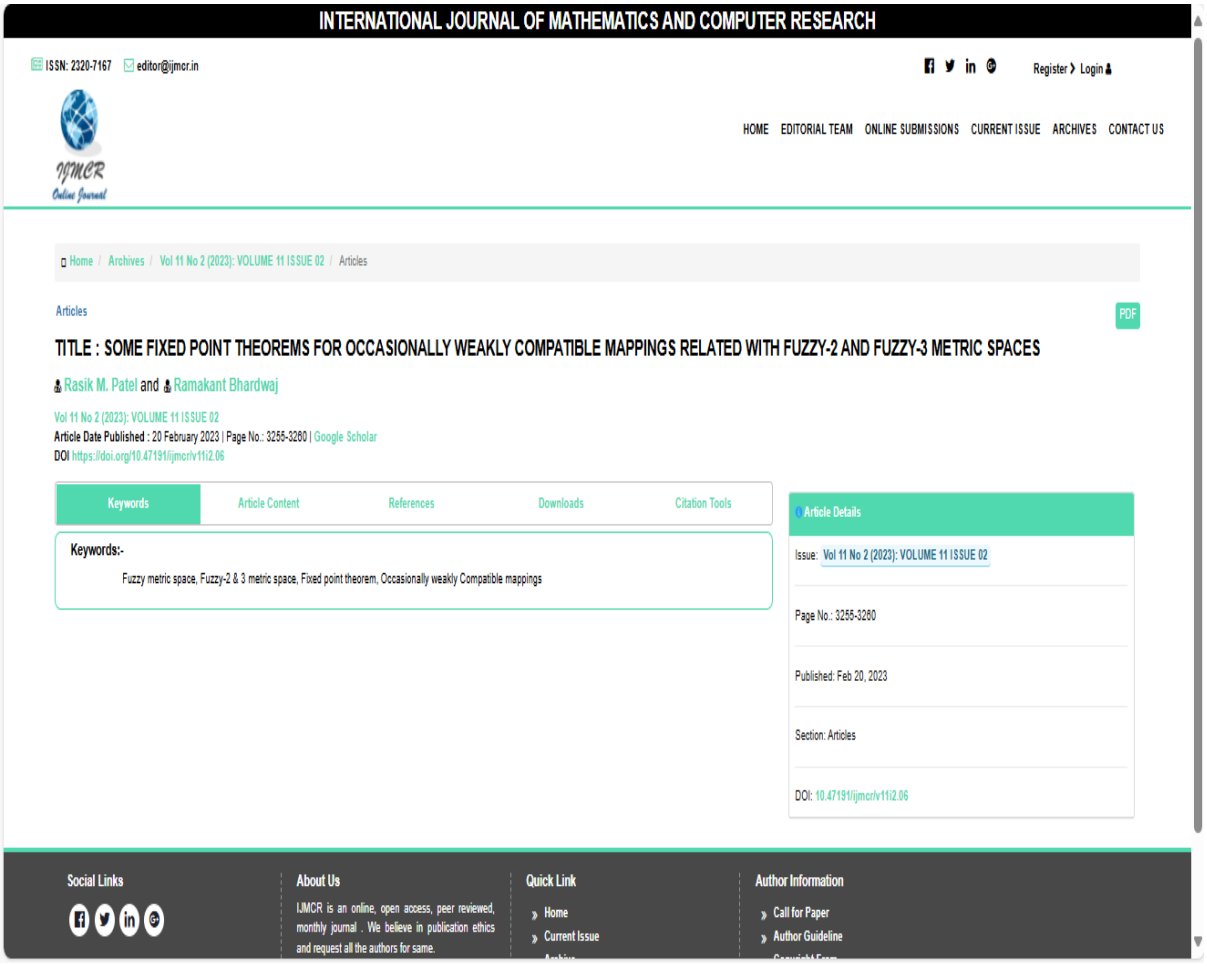
[1]Title Name: Some Fixed Point Theorems for Occasionally Weakly Compatible Mappings Related with Fuzzy-2 and Fuzzy-3 Metric Spaces.

~ By Dr. Rasik Patel

Calendar Year of publication: 2023

1.Cover page of Journal/book:



INTERNATIONAL JOURNAL OF MATHEMATICS AND COMPUTER RESEARCH

ISSN: 2320-7167 editor@ijmcr.in

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Rasik M. Patel and Ramakant Bhardwaj

Vol 11 No 2 (2023): VOLUME 11 ISSUE 02

Article Date Published : 20 February 2023 | Page No.: 3255-3260 | Google Scholar

DOI https://doi.org/10.47191/ijmcr/v11i2.06

Keywords | Article Content | References | Downloads | Citation Tools

Keywords:-

Fuzzy metric space, Fuzzy-2 & 3 metric space, Fixed point theorem, Occasionally weakly Compatible mappings

Article Details

Issue: Vol 11 No 2 (2023): VOLUME 11 ISSUE 02

Page No.: 3255-3260

Published: Feb 20, 2023

Section: Articles

DOI: 10.47191/ijmcr/v11i2.06

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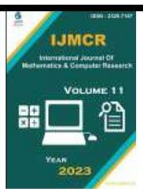
2.First Page of Publication:

International Journal of Mathematics and Computer Research
ISSN: 2320-7167
Volume 11 Issue 02 February 2023, Page no. – 3255-3260
Index Copernicus ICV: 57.55, Impact Factor: 7.362
DOI: 10.47191/ijmcr/v11i2.06



Some Fixed Point Theorems for Occasionally Weakly Compatible Mappings Related with Fuzzy-2 and Fuzzy-3 Metric spaces

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ARTICLE INFO
Published Online:
20 February 2023
Corresponding Author:
Rasik M.Patel

ABSTRACT
In this paper, we give some definitions of occasionally weakly compatible maps in fuzzy-2 metric and fuzzy-3 metric spaces and some common fixed point theorems for six mappings under the condition of occasionally weakly compatible mappings in complete Fuzzy-2 and Fuzzy-3 matric spaces.
2010 Mathematics Subject Classification: Primary 47H10, 54H25

KEYWORDS: Fuzzy metric space, Fuzzy-2 & 3 metric space, Fixed point theorem, Occasionally weakly Compatible mappings

I. INTRODUCTION

Impact of fixed point theory in different branches of mathematics and its applications is immense. The first result on fixed points for contractive type mapping was the much celebrated Banach's contraction principle by S. Banach [19] in 1922. In the general setting of complete metric space, this theorem runs as the follows, Theorem 1.1 (Banach's contraction principle) Let (X, d) be a complete metric space, c∈ (0, 1) and f: X→X be a mapping such that for each x, y ∈ X, d (fx, fy) ≤ c d(x, y).Then f has a unique fixed point a∈X, such that for each x ∈ X, $\lim_{n\to\infty} f^n x = a$. After the classical result, R.Kannan [16] gave a subsequently new contractive mapping to prove the fixed point theorem. Since then a number of mathematicians have been worked on fixed point theory dealing with mappings satisfying various type of contractive conditions. In 2002, A. Branciari [1] analyzed the existence of fixed point for mapping f defined on a complete metric space (X , d) satisfying a general contractive condition of integral type.

Theorem 1.2 (A.Branciari) Let (X, d) be a complete metric space, c∈ (0, 1) and let f: X→X be a mapping such that for each x, y ∈ X, $\int_0^{d(fx,fy)} \varphi(t)dt \le c\int_0^{d(x,y)} \varphi(t)dt$. Where φ: [0,+∞) →[0,+∞) is a Lebesgue integrable mapping which is summable on each compact subset of [0,+∞) , non negative, and such that for each ε >o, $\int_0^{\varepsilon} \varphi(t)dt$, then f has a unique fixed point a ∈ X such that for each x ∈X, $\lim_{n\to\infty} f^n x = a$ After the paper of Branciari, a lot of a research works have been carried out on generalizing contractive conditions of integral type for a different contractive mapping satisfying various known properties. A fine work has been done by Rhoades [3] extending the result of Branciari by replacing the condition by the following

$$\int_0^{d(fx,fy)} \varphi(t)dt \le \int_0^{max\left\{d(x,y),d(x,fx),d(y,fy),\frac{d(x,fy)+d(y,fx)}{2}\right\}} \varphi(t)dt$$

The aim of this paper is to generalize some mixed type of contractive conditions to the mapping and then a pair of mappings, satisfying a general contractive mapping such as R. Kannan type [16], S.K. Chatrterjee type [20], T. Zamfirescu type [25], Schweizer and A.Sklar [21]etc.

The concept of Fuzzy sets was introduced initially by Zadeh [27]. Since then, to use this concept in topology and analysis many authors have expansively developed the theory of fuzzy sets. Both George and Veermani [4], Kramosil [8] modified the notion of fuzzy metric spaces with the help of continuous t-norms. Many researchers have obtained common fixed point theorems for mappings satisfying different types of commutativity conditions. Vasuki [17] proved fixed point theorems for R-weakly commutating mappings. R.P. Pant and Jha [13, 14, 15] introduced the new concept reciprocally continuous mappings and established

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