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# SOME FIXED POINT RESULTS USING $F$-CONTRACTION ON DIGITAL METRIC SPACE

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## ABSTRACT

Fixed point theory plays an important role in many branches of mathematics such as mathematical analysis, general topology and functional analysis, which leads to many applications in fields such as computer science, engineering, game theory, fuzzy theory and image processing. In metric fixed point theory began with the Banach fixed point theorem [2]; it guarantees the existence and uniqueness of fixed points of certain self-maps of metric spaces, and provides a structural method of finding those fixed points [1]. Park et. al. [5] introduced set-valued additive functional equations and prove the Hyers-Ulam stability of the set-valued additive functional equations by using the fixed point method. Therefore the Banach fixed point theorem becomes an basic tool for solution of some problems in mathematics and engineering. On the other hand, an important generalization of the Banach fixed point theorem was made by Wardowski [6] in 2012 with the definition of the $F$-contraction class. The most important feature of the $F$-contraction mapping is that the mentioned studies are carried out without imposing any restrictions on the structure of the space or the contraction condition. No doubt, many generalizations of $F$-contraction mappings have been made It is said that the 21st century is the age of information and technology. Computer communication, video conferencing, video calling, broadcasting, teleconferencing and image transfer are examples of these applications today. The obvious reason behind digital visual communication is that the digital image representation of data allows the user to easily process visual information in a useful way. Fixed point theory plays an crucial role in image processing and computer graphics. The main goal in this research field is to obtain significant fixed point results on digital images. There have been many developments in digital topology, which has become very popular in recent years. Ege and Karaca [4], proved the Banach fixed point theorem in digital metric spaces and gave an application to image processing. Dolhare and Nalawade [3] generalized the principle by replacing the contraction condition of Banach by a condition that involves monotone non-decreasing function. They also gave a detailed application of the fractal image compression technique. In this talk, we give $F$-contraction class in digital metric spaces and prove fixed point results with the help of the $F$-contraction mapping. Also, we mention an important application of Banach fixed point theorem to digital images.

***Keywords*** Fixed point · $F$-contraction · digital metric space

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