VINGNANAM Research Conference

21st of July 2022

VRC–2022

Faculty of Science
University of Jaffna
Sri Lanka

Jointly Organized by

Faculty of Science
University of Jaffna
Sri Lanka

Western Norway University of Applied Sciences

Fixed point theorem on strong fuzzy metric space

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The problem of constructing a satisfactory theory of fuzzy metric spaces has been investigated by several authors from different point of view. The concept of fuzzy sets was introduced by L. A. Zadeh. Following fuzzy metric space modified by I. Kramosil, J. Mickalek -George and Veeramani using continuous triangular norm. Modern fuzzy technique is used to generalized some conventional and latest results. A fuzzy metric space is an ordered triple $(X, M, *)$ such that X is a set, $*$ is continuous triangular norm and M is a function defined on $X \times X \times [0, \infty)$ with value in $[0,1]$ satisfying certain axioms and M is called fuzzy metric on X. The objective of this paper is to prove fixed point theorem of strong fuzzy metric space by using control function under minimum continuous triangular norm condition. That is $(X, M, *)$ be a complete strong fuzzy metric space with minimum continuous triangular norm $*$ and T is self-mapping in X. If there exists control function ψ and $\lambda_i = \lambda_i(t)$, $i = 1, 2, 3, 4, 5$ with $\lambda_i = \geq 0$ and $\lambda_1 + \lambda_2 + \lambda_3 + 2\lambda_4 + \lambda_1 < 1$ such that $\psi[M(Tu, Tv, t)] \leq \lambda_1\psi[M(u, Tu, t)] + \lambda_2\psi[M(v, Tv, t)] + \lambda_3\psi[M(Tu, v, t)] + \lambda_4\psi[M(u, Tv, t)] + \lambda_5\psi[M(u, v, t)]$. Then T has a unique fixed point in X. In addition, we illustrated some examples of strong fuzzy metric space.

Keywords: Fuzzy metric space, Banach fixed point theorem, Control function.