

Strong coupled fixed point analysis in fuzzy metric spaces and an application to Urysohn integral equations

Xiangling Li¹, Saif Rehman², Sami Khan², Nawab Hussain³, Jamshaid Ahmad⁴, and Hassen Aydi⁵

¹Hebei University of Architecture

²Gomal University

³King Abdulaziz University

⁴University of Jeddah

⁵Université de Sousse Institut Supérieur d'Informatique et des Technologies de Communication de Hammam Sousse

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Abstract

The aim of this paper is to establish some strong coupled fixed point theorems via a new concept of cyclic contractive type mappings in the context of fuzzy metric spaces. Moreover, we ensure the existence of a common solution of the two Urysohn type integral equations:
$$\begin{aligned} & \xi(t) = \int_a^b K_1(t,s,\xi(s))ds + h_1(t), \\ & \eta(t) = \int_a^b K_2(t,s,\xi(s))ds + h_2(t), \end{aligned}$$
 where $I \subset [a,b] \subset \mathbb{R}$, $\xi, h_1, h_2 \in C([a,b], \mathbb{R})$ and $K_1, K_2: [a,b]^2 \times \mathbb{R} \rightarrow \mathbb{R}$.

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