EXISTENCE AND UNIQUENESS OF SOLUTIONS TO A SYSTEM OF FUNCTIONAL EQUATIONS AND APPLICATIONS TO PARTIAL METRIC SPACES

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Abstract. In this paper, we discuss the existence and uniqueness of solutions to the system of functional equations:

\[
\begin{cases}
T x = x \\
\varphi(x) = 0
\end{cases}
\]

where \( T : X \rightarrow X \) is a given mapping and \( \varphi : X \rightarrow [0, \infty) \) is a lower semi-continuous function on \( X \) endowed with a metric \( d \). We apply our obtained results to derive some fixed point theorems on partial metric spaces. This answers three open problems posed by Ioan A. Rus in [Fixed point theory in partial metric spaces, Anal. Univ. de Vest, Timisoara, Seria Matematic˘ a-Informatic˘ a, 46 (2) (2008) 141-160].

Key Words and Phrases: Partial metric space; metric space; fixed point; homotopy.

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References


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