On Nonlinear Probabilistic F-Contractions and Non-Self Mappings in Strictly Convex Menger PM-Spaces

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Fixed point theory in probabilistic metric spaces represents a natural extension of classical metric fixed point theory, allowing the incorporation of uncertainty through distribution functions instead of deterministic distances. In particular, Menger probabilistic metric spaces (Menger PM-spaces) provide a flexible framework for studying convergence and stability phenomena in stochastic environments.
Recent developments have focused on extending contractive conditions to more general forms, especially for non-self mappings, where standard techniques are not directly applicable. Inspired by the classical results of B. E. Rhoades ([2]) and modern approaches to F-contractions introduced by D. Wardowski ([3]), there is a growing interest in nonlinear and probabilistic generalizations of contractive mappings.
In this context, the present work ([1]) introduces a new class of nonlinear probabilistic contractions and establishes fixed point results in strictly convex Menger PM-spaces. The obtained results generalize several known fixed point theorems. An illustrative example is provided to demonstrate the applicability of the main theorem.

References

[1] R. Nikolic, S. Ješic, V. Ristic, J. Vujadinovic, *Fixed point theorems for non-self mappings with nonlinear probabilistic F-contraction in strictly convex Menger PM-spaces*, accepted for publication in J. Nonlinear Convex Anal.

[2] B. E. Rhoades, *A fixed point theorem for some non-self mappings*, Math. Japon. **23** (1978), 457–459

[3] D. Wardowski, *Fixed points of a new type of contractive mappings in complete metric spaces*, Fixed Point Theory Appl. 2012, **94** (2012).