FIXED-POINT THEORY IN DIGITAL METRIC SPACES

Nebojsa Ralevic[1], Tatjana Dosenovic[2], Marija Paunovic[4], Dejan Cebic[6], Djordje Dragic[1]
[1]Faculty of Technical Sciences, University of Novi Sad, Novi Sad 21000, Serbia
[2]Faculty of Technology, University of Novi Sad, Novi Sad 21000, Serbia
[3]Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjačka Banja, 36000, Serbia
[4]Faculty of Mining and Geology, University of Belgrade, Belgrade 11000, Serbia

Corresponding author e-mail address: nralević@uns.ac.rs (N. Ralevic)

ABSTRACT:
Banach's fixed point theorem, as one of the most important theorems of nonlinear analysis, is a very important test for solving various problems in mathematics and engineering. There are many results of fixed point theory in the literature and many of them generalize and extend Banach's contraction principle. One of the most recent applications of Banach's theorem is in image processing using digital metric spaces. In the paper, the notion of digital metric space is generalized by using uncertainty. For this purpose, various fuzzy metrics and aggregation functions were used, especially triangular norms. Our research is based on the generalization of Banach's theorem and its generalizations in generalized digital metric spaces using uncertainty with application in image processing. The properties of generalized digital metric spaces are also considered.

Keywords: *fixed point theorem, digital metric spaces, aggregation functions, triangular norm*