Fixed points for mappings defined on generalized gauge spaces

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ABSTRACT.

In this article, the distinct classes of continuous pseudo-gauge structures and pseudometrics (perfect, quasi-perfect, sequentially complete) are defined and studied in depth. The conditions under which the set of fixed points of a given mapping of a space with concrete pseudo-gauge structure is non-empty are determined. Some examples are proposed.

REFERENCES

[1] Antonovskii, M. Ja., Boltjanskii, V. G. and Sarymsakov., T. A., *A survey of the theory of topological semifields*, Uspehi Mat. Nauk **21** (1966), No. 4, 185–218 (in Russian) (English translation: Russian Math. Surveys **21** (1966), No. 4, 163-192)

[2] Beckenstein, E., Narici, L. Suffel, C., *Topological Algebras*, North Holland Publ. Com., New York, 1977

[3] Berinde, V., *Generalized contractions in σ-complete vector lattices*, Univ. u Novom Sadu, Zb. Rad. Prirod.-Mat. Fak. Ser. Mat., **24** (1994), No. 2, 31–38

[4] Berinde, V. and Choban, M., *Remarks on some completeness conditions involved in several common fixed point theorems*, Creat. Math. Inform., **19** (2010), No. 1, 1–10

[5] Berinde, V. and Choban, M., *Generalized distances and their associate metrics. Impact on fixed point theory*, Creat. Math. Inform., **22** (2013), No. 1, 23–32

[6] Birkhoff, G., *Lattice Theory*, Providence, 1967

[7] Caristi,J., *Fixed point theorems for mappings satisfying inwardness conditions*, Trans. Amer. Math. Soc., **215** (1976), 241–251

[8] Cauty, R., *Solution du probléme de point fixe de Schauder*, Fund. Math., **170** (2001), 231–246

[9] Cauty, R., Un théorème de point fixe pour les fonctions multivoques acycliques, In: V. Kadets and W. Zelazko (editors), *Functional Analysis and its Applications*, Proceed. of the Intern. Conf. dedicated to 110th Anniversary of Stefan Banach, May 28-31, 2002, Lviv, Ukraine, Elsevier, 2004, 71–80

[10] Choban, M. M., *Fixed points for mappings defined on pseudometric spaces*, Creative Mathematics and Informatics, **22** (2013), No. 2, 173–184

[11] Choban, M. M., *Fixed points for mappings defined on generalized gauge spaces*, 5th Minisymposium on Fixed Point: Theory and Applications, june 1-7, 2014, Baia Mare and Turist Suior Resort, Romania, Abstracts, Baia Mare, 2014, 8–9

[12] Choban, M. M. and Calmutchi, L. I., *Fixed points theorems in multi-metric spaces*, Annals of the Academy of Romanian Scientists, Series on Mathematics and its Applications, **3** (2011) 46–68

[13] Choban, M. M. and Calmutchi, L. I., *Fixed points theorems in E-metric spaces*, ROMAI Journal, **6** (2010), No. 2, 83–91

[14] Engelking, R., *General Topology*, PWN. Warszawa, 1977

[15] Gelfand, I. M. Raikov, D. A. and Šilov, G. E., *Commutative Normed Rings*, Gos. Izd-vo Fiziko-Matem. Lit., Moskva, 1960 (in Russian), (English translation: Chelsea, New York, 1964)

[16] Granas, A., and Dugundji, J., *Fixed point theory*, Springer-Verlag, New York, 2003

[17] Iseki, K., *On a Banach theorem on contractive mappings*, Proceed. Japan Academy, **41** (1965), 145–146

[18] Nedev, S. I. and Choban, M. M., *A general concept of metrizability for topological spaces*, Annuare Univers. Sofia, Facult. Math., **65** (1973), 111–165

[19] Rus, I. A., *The theory of a metrical fixed point theorem: theoretical and applicative relevance*, Fixed Point Theory, **9** (2008), 293–307

[20] Rus, I. A., Petrusel, A. and Petrusel, G., *Fixed point theory*, Cluj University Press, Cluj-Napoca, 2008

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