FIXED POINT THEORY FOR MULTIVALUED OPERATORS ON A SET WITH TWO METRICS

ADRIAN PETRUŞEL AND IOAN A. RUS

Department of Applied Mathematics
Babeş-Bolyai University Cluj-Napoca
Kogălniceanu 1, 400084, Cluj-Napoca, Romania
E-mails: petrusel@math.ubbcluj.ro, iarus@math.ubbcluj.ro

Abstract. The purpose of this work is to present some fixed point results for multivalued operators on a set with two metrics. A multivalued version of Maia's fixed point theorem is proved. The data dependence and the well-posedness of the fixed point problem are also discussed. Some extensions to generalized multivalued contractions are pointed out.

Key Words and Phrases: set with two metrics, Maia fixed point theorem, multivalued operator, fixed point, strict fixed point, well-posed fixed point problem, generalized contraction, data dependence.

2000 Mathematics Subject Classification: 47H10, 54H25, 47H04.

REFERENCES

[1] R. P. Agarwal, D. O'Regan, *Fixed point theory for generalized contractions on spaces with two metrics*, J. Math. Anal. Appl., **248**(2000), 402-414.

[2] L. B. Ćirić, *Fixed points for generalized multi-valued contractions*, Math. Vesnik, **9**(24)(1972), 265-272.

[3] H. Covitz, S.B. Nadler Jr., *Multi-valued contraction mapping in generalized metric spaces*, Israel J. Math., **8**(1970), 5-11.

[4] S. Hu and N. S. Papageorgiou, *Handbook of Multivalued Analysis*, Vol. I-II, Kluwer Academic Publishers, Dordrecht, 1997, 1999.

[5] W. A. Kirk, B. Sims (eds.), *Handbook of Metric Fixed Point Theory*, Kluwer Acad. Publ., Dordrecht, 2001.

[6] S. B. Nadler Jr., *Multivalued contraction mappings*, Pacific J. Math., **30**(1969), 475-488.

[7] A. Petruşel, *Generalized multivalued contractions*, Nonlinear Analysis, **47**(2001), 649-659.

[8] A. Petruşel, *Multivalued weakly Picard operators and applications*, Scienticae Mathematicae Japonicae, **59**(2004), 167-202.

[9] A. Petruşel, I. A. Rus, *Multivalued Picard and weakly Picard operators*, Fixed Point Theory and Applications (J. Garcia Falset, E. LLorens Fuster, B. Sims eds.), Yokohama Publishers 2004, pp. 207-226.

[10] A. Petruşel, I. A. Rus, *Well-posedness of the fixed point problem for multivalued operators*, Applied Analysis and Differential Equations (O. Cârjă, I. I. Vrabie eds.), World Scientific 2007, pp. 295-306.

[11] S. Reich, *Fixed points of contractive functions*, Boll. U.M.I., **5**(1972), 26-42.

[12] I. A. Rus, *Generalized Contractions and Applications*, Transilvania Press Cluj-Napoca, 2001.

[13] I. A. Rus, *Strict fixed point theory*, Fixed Point Theory, **4**(2003), 177-183.

[14] I. A. Rus, A. Petruşel, G. Petruşel, *Fixed Point Theory 1950-2000 : Romanian Contributions*, House of the Book of Science, Cluj-Napoca, 2002.

[15] I. A. Rus, A. Petruşel, A. Sîntămărian, *Data dependence of the fixed point set of some multivalued weakly Picard operators*, Nonlinear Analysis, **52**(2003), 1947-1959.

[16] A. Sîntămărian, *Metrical strict fixed point theorems for multivalued mappings*, Seminar on Fixed Point Theory, 1997, 27-31.