A generalization of Nadler fixed point theorem

FRANCESCA VETRO

ABSTRACT.

Jleli and Samet gave a new generalization of the Banach contraction principle in the setting of Branciari metric spaces [Jleli, M. and Samet, B., *A new generalization of the Banach contraction principle*, J. Inequal. Appl., **2014**:38 (2014)]. The purpose of this paper is to study the existence of fixed points for multivalued mappings, under a similar contractive condition, in the setting of complete metric spaces. Some examples are provided to illustrate the new theory.

REFERENCES

[1] Abbas, M., Ali, B. and Vetro, C., *A Suzuki type fixed point theorem for a generalized multivalued mapping on partial Hausdorff metric spaces*, Topology Appl., **160** (2013), 553–563
[2] Alghamdi, M. A., Berinde, V. and Shahzad, N., *Fixed points of multivalued nonself almost contractions*, J. Appl. Math., **2013**, Art. ID 621614, 6 pp.
[3] Amini-Harandi, A., *Fixed point theory for set-valued quasi-contraction maps in metric spaces*, Appl. Math. Lett., **24** (2011), 1791–1794
[4] Aydi, H., Abbas, M. and Vetro, C., *Partial Hausdorff metric and Nadler's fixed point theorem on partial metric spaces*, Topology Appl., **159** (2012), 3234–3242
[5] Berinde, M. and Berinde, V., *On a general class of multi-valued weakly Picard mappings*, J. Math. Anal. Appl., **326** (2007), 772–782
[6] Berinde, V. and Păcurar, M., *The role of the Pompeiu-Hausdorff metric in fixed point theory*, Creat. Math. Inform., **22** (2013), 35–42
[7] Ćirić, L., *Multi-valued nonlinear contraction mappings*, Nonlinear Anal., **71** (2009), 2716–2723
[8] Chifu, C. and Petruşel, G., *Existence and data dependence of fixed points and strict fixed points for contractive-type multivalued operators*, Fixed Point Theory Appl, **2007**, Art. ID 34248, 8 pp.
[9] Daffer, P. Z. and Kaneko, H., *Fixed points of generalized contractive multi-valued mappings*, J. Math. Anal. Appl., **192** (1995), 655–666
[10] Jleli, M. and Samet, B., *A new generalization of the Banach contraction principle*, J. Inequal. Appl., **2014**:38 (2014)
[11] Kamran, T., *Mizoguchi-Takahashi's type fixed point theorem*, Comput. Math. Appl., **57** (2009), 507–511
[12] Mohammadi, B., Rezapour, S. and Shahzad, N., *Some results on fixed points of α-ψ-Ćirić generalized multifunctions*, Fixed Point Theory Appl., **2013**:24 (2013)
[13] Nadler, S. B., *Multivalued contraction mappings*, Pac. J. Math., **30** (1969), 475–488
[14] Nieto, J. J. and Rodríguez-López, R. *Contractive mapping theorems in partially ordered sets and applications to ordinary differential equations*, Order, **22** (2005), 223-239
[15] Nieto, J. J. and Rodríguez-López, R., *Existence and uniqueness of fixed point in partially ordered sets and applications to ordinary differential equations*, Acta Math. Sin. (English Ser.), **23** (2007), 2205–2212
[16] Petruşel, A., *Integral inclusions. Fixed point approaches*, Comm. Math. Prace Mat., **40** (2000), 147–158
[17] Ran, A. C. M. and Reurings, M. C., *A fixed point theorem in partially ordered sets and some applications to matrix equations*, Proc. Amer. Math. Soc., **132** (2004), 1435–1443
[18] Rus, I. A., Petruşel, A. and Petruşel, G., *Fixed Point Theory*, Cluj University Press, Cluj-Napoca, 2008
[19] Sgroi, M. and Vetro, C., *Multi-valued F-contractions and the solution of certain functional and integral equations*, Filomat, **27** (2013), 1259–1268
[20] Vetro, C. and Vetro, F., *Caristi Type Selections of Multivalued Mappings*, J. Funct. Spaces, **2015**, Art. ID 941856, 6 pp.

[21] Zhong, C.-K., Zhu, J. and Zhao, P.-H., *An extension of multi-valued contraction mappings and fixed points*, Proc. Am. Math. Soc., **128** (2000), 2439–2444

Università degli Studi di Palermo
Dipartimento Energia
Ingegneria dell'Informazione e Modelli Matematici (DEIM)
Viale delle Scienze, 90128 Palermo, Italy
E-mail address: francesca.vetro@unipa.it