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Dedicated to Professor Emeritus Ioan A. Rus on the occasion of his 80^{th} anniversary

Fixed point theorems for nonself G-almost contractive mappings in Banach spaces endowed with graphs

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ABSTRACT.

In this paper, we prove some fixed point theorems for non-self G-almost contractive mappings in Banach spaces with a directed graph and give some examples to illustrate our main results. The main results in this paper extend and generalize many known results in the literature therein.

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REFERENCES

[1] Agarwal, R. P., O'Regan, D. and Sahu, D. R., *Fixed Point Theory for Lipschitzian Type-Mappings with Applications*, Springer, New York, NY, USA, 2009
[2] Alfuraidan, M. R., *Fixed points of monotone nonexpansive mappings with a graph*, Fixed Point Theory Appl., 2015, 2015:49, 6 pp.
[3] Alghamdi, M. A., Berinde, V. and Shahzad, N., *Fixed points of non-self almost contractions*, Carpathian J. Math., **30** (2014), No. 1, 7–14
[4] Alghamdi, M. A., Berinde, V. and Shahzad, N., *Fixed points of multivalued nonself almost contractions*, J. Appl. Math., 2013, Art. ID 621614, 6 pp.
[5] Assad, N. A., *A fixed point theorem for some non-self-mappings*, Tamkang J. Math., **21** (1990), 387–393
[6] Banach, S., *Sur les opérations dans les ensembles abstraits et leur application aux équations intégrales*, Fund. Math., **3** (1922), 133–181
[7] Bang-Jensen, J. and Gutin, G., Digraphs Theory, Algorithms and Applications, *Springer Monographs in Mathematics*, Springer-Verlag London Ltd., London, 2007
[8] Beg, I. and Butt, A. R., *Fixed point of set-valued graph contractive mappings*, J. Inequal. Appl., 2013, 2013:252
[9] Berinde, V. and Păcurar, M., *Fixed point theorems for nonself single-valued almost contractions*, Fixed Point Theory, **14** (2013), No. 2, 301–312
[10] Berinde, V., *Approximating fixed points of weak contractions using the Picard iteration*, Nonlinear Anal. Forum, **9** (2004), No. 1, 43–53
[11] Berinde, V., *Approximating fixed points of weak ϕ-contractions using the Picard iteration*, Fixed Point Theory, **4** (2003), No. 2, 131–142
[12] Berinde, V., *On the approximation of fixed points of weak contractive mappings*, Carpathian J. Math., **19** (2003), No. 1, 7–22

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[13] Berinde, V. and Păcurar, M., *Fixed point theorems for nonself single-valued almost contractions*, Fixed Point Theory, **14** (2013), No. 2, 301–311
[14] Berinde, V. and Păcurar, M., *The contraction principle for nonself mappings on Banach spaces endowed with a graph*, J. Nonlinear Convex Anal., **16** (2015), No. 9, 1925–1936
[15] Bojor, F., *Fixed point theorems for Reich type contractions on metric spaces with a graph*, Nonlinear Anal., **75** (2012), 3895–3901
[16] Jachymski, J., *The contraction principle for mappings on a metric space with a graph*, Proc. Amer. Math. Soc., **136** (2008), 1359–1373
[17] Pang, C., Zhang R., Zhang, Q. and Wang, J., *Dominating sets in directed graphs*, Inform. Sci., **180** (2010) 3647–3652
[18] Takahashi, W., *Nonlinear Functional Analysis*, Yokohama Publishers, Yokohama, 2000
[19] Tiammee, J. and Suantai, S., *Coincidence point theorms for graph-preserving multi-valued mappings*, Fixed Point Theory Appl., 2014, 2014:70, 11 pp.

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