

## A FIXED POINT THEOREM IN UNIFORM SPACES GENERATED BY A FAMILY OF $b$ -PSEUDOMETRICS

HAMID FARAJI\*, KOUROSH NOUROUZI\*\* AND DONAL O'REGAN\*\*\*

\*Department of Mathematics, Science and Research Branch  
Islamic Azad University, Tehran, Iran

\*\*Faculty of Mathematics, K. N.Toosi University of Technology  
P.O. Box 16315-1618, Tehran, Iran  
E-mail: [nourouzi@kntu.ac.ir](mailto:nourouzi@kntu.ac.ir)

\*\*\*School of Mathematics, Statistics and Applied Mathematics  
National University of Ireland, Galway, University Road, Galway, Ireland

**Abstract.** In this paper, we discuss the existence of fixed points of mappings defined on uniform spaces generated by a family of  $b$ -pseudometrics. We also give some sufficient conditions under which the fixed point is unique.

**Key Words and Phrases:** Uniform spaces,  $b$ -pseudometrics, fixed points.

**2010 Mathematics Subject Classification:** 47H10.

### REFERENCES

- [1] S.P. Acharya, *Some results on fixed points in uniform spaces*, Yokohama Math. J., **22**(1974), 105-116.
- [2] V. Angelov, *Fixed Points in Uniform Spaces and Applications*, Cluj University Press, 2009.
- [3] I.A. Bakhtin, *The contraction mapping principle in almost metric space*, *Functional analysis*, (Russian), Ulyanovsk. Gos. Ped. Inst., Ulyanovsk, (1989), 26-37.
- [4] S. Czerwik, *Contraction mappings in  $b$ -metric spaces*, Acta Math. Inform. Univ. Ostraviensis, **1**(1993), 5-11.
- [5] S. Czerwik, *Nonlinear set-valued contraction mappings in  $b$ -metric spaces*, Atti Sem. Mat. Fis. Univ. Modena, **46**(1998), 263-276.
- [6] J. Heinonen, *Lectures on Analysis on Metric Spaces*, Universitext, Springer-Verlag, New York, 2001.
- [7] K.D. Joshi, *Introduction to General Topology*, John Wiley Sons, Inc., 1983.
- [8] M.A. Khamsi, N. Hussain, *KKM mappings in metric type spaces*, Nonlinear Anal., **73**(2010), no. 9, 3123-3129.
- [9] W. Kirk, N. Shahzad, *Fixed Point Theory in Distance Spaces*, Springer, Cham, 2014.
- [10] A. Petruşel, G. Petruşel, B. Samet, J.-C. Yao, *Coupled fixed point theorems for symmetric multi-valued contractions in  $b$ -metric space with applications to systems of integral inclusions*, J. Nonlinear Convex Anal., **17**(2016), no. 7, 1265-1282.
- [11] A. Petruşel, G. Petruşel, B. Samet, J.-C. Yao, *Coupled fixed point theorems for symmetric contractions in  $b$ -metric spaces with applications to operator equation systems*, Fixed Point Theory, **17**(2016), no. 2, 457-475.

- [12] W. Sintunavarat, *Nonlinear integral equations with new admissibility types in b-metric spaces*, J. Fixed Point Theory Appl., **18** (2016), no. 2, 397-416.
- [13] S. Willard, *General Topology*, Addison-Wesley Publishing Co., Reading, Mass.-London-Don Mills, Ont., 1970.

*Received: September 6, 2016; Accepted: November 11, 2016.*

