COMMON FIXED POINTS THROUGH IMPLICIT ITERATION PROCESS WITH ERRORS

ARIF RAFIQ

Department of Mathematics
COMSATS Institute of Information Technology
Islamabad, Pakistan
E-mail: arafiq@comsats.edu.pk

Abstract. We establish a general theorem to approximate common fixed points of quasi-contractive operators on a normed space through the implicit iteration process with errors in the sense of Xu [20]. Our result generalizes and improves upon, among others, the corresponding results of [1, 2, 3, 5, 14, 18].

Key Words and Phrases: common fixed point, implicit iteration process with errors, strong convergence.

2000 Mathematics Subject Classification: 47H10, 47H17, 54H25.

References

[1] R. P. Agarwal, Y. J. Cho, J. Li and N. J. Huang, *Stability of iterative procedures with errors approximating common fixed points for a couple of quasi-contractive mappings in q-uniformly smooth Banach spaces*, J. Math. Anal. Appl., **272** (2002), 435-447.

[2] V. Berinde, *On the convergence of the Ishikawa iteration in the class of quasi contractive operators, Acta Math Univ. Comenianae*, LXXIII, **1** (2004), 119-126.

[3] V. Berinde, A convergence theorem for some mean value fixed point iteration procedures, Dem. Math. **38 (1)** (2005), 177-184.

[4] S. K.Chatterjea, *Fixed point theorems,* C. R. Acad. Bulgare Sci., **25** (1972), 727-730.

[5] G. Das and J. P. Debata, *Fixed points of Quasi-nonexpansive mappings,* Indian J. Pure. Appl. Math., **17** (1986), 1263–1269.

[6] S. Ishikawa, *Fixed points by a new iteration method,* Proc. Amer. Math. Soc., **44** (1974), 147-150.

[7] R. Kannan, *Some results on fixed points,* Bull. Calcutta Math. Soc., **10** (1968), 71-76.

[8] R. Kannan, *Some results on fixed points III,* Fund. Math.,**70** (1971),169-177.

[9] R. Kannan, *Construction of fixed points of class of nonlinear mappings,* J. Math. Anal. Appl., **41** (1973), 430-438.

[10] L. S. Liu, *Ishikawa and Mann iterative process with errors for nonlinear strongly accretive mappings in Banach spaces*, J. Math. Anal. Appl., **194 (1)** (1995),114–125.

[11] W. R. Mann, *Mean value methods in iterations* , Proc. Amer. Math. Soc., **4** (1953), 506-510.

[12] M. O. Osilike, *Short proofs of stability results for fixed point iteration procedures for a class of contractive-type mappings,* Indian. J. Pure and Appl. Math., **30 (12)**1999, 1229-1234

[13] M. O. Osilike, *Stability results for fixed point iteration procedures,* J. Nigerian Math. Soc., **14/15**, 1995/1996, 17-29.

[14] A. Rafiq, *A note on the theorem of V. BERINDE,* Dem. Math., Accepted.

[15] B. E. Rhoades, *Fixed point iteration using infinite matrices*, Trans. Amer. Math. Soc., **196** (1974), 161-176.

[16] B. E. Rhoades,*Comments on two fixed point iteration methods*, J. Math. Anal. Appl., **56 (2)** (1976), 741-750.

[17] W. Takahashi, *Iterative methods for approximation of fixed points and thier applications*, J. Oper. Res. Soc. Jpn., **43 (1)** (2000), 87-108.

[18] W. Takahashi and T. Tamura, *Convergence theorems for a pair of nonexpansive mappings*, J. Convex Analysis, **5 (1)** (1995), 45-58.

[19] X. Weng, *Fixed point iteration for local strictly pseudocontractive mapping*, Proc. Amer. Math. Soc. **113 (3)** (1991), 727–731.

[20] Y. Xu, *Ishikawa and Mann iteration process with errors for nonlinear strongly accretive operator equations*, J. Math. Anal. Appl., **224** (1998), 91-101.

[21] T. Zamfirescu, *Fix point theorems in metric spaces,* Arch. Math. (Basel), **23** (1972), 292-298.