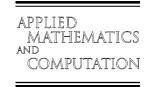


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Viscosity approximation methods for a common fixed point of finite family of nonexpansive mappings

Habtu Zegeye a, Naseer Shahzad b,*

^a Bahir Dar University, P.O. Box 859, Bahir Dar, Ethiopia
^b Department of Mathematics, King Abdul Aziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Let K be a nonempty closed and convex subset of a real Banach space E. Let $T: K \to E$ be a nonexpansive weakly inward mapping with $F(T) \neq \emptyset$ and $f: K \to K$ be a contraction. Then for $t \in (0,1)$, there exists a sequence $\{y_t\} \subset K$ satisfying $y_t = (1-t)f(y_t) + tT(y_t)$. Furthermore, if E is a strictly convex real reflexive Banach space having a uniformly Gâteaux differentiable norm, then $\{y_t\}$ converges strongly to a fixed point P of P such that P is the unique solution in P(T) to a certain variational inequality. Moreover, if P is a family of nonexpansive mappings, then an explicit iteration process which converges strongly to a common fixed point of P is a family P and to a solution of a certain variational inequality is constructed. Under the above setting, the family P is P in P and to a solution of a certain variational inequality is constructed. Under the above setting, the family P is P in P in P and to a solution of a certain variational inequality is constructed. Under the above setting, the family P is P in P

Keywords: Nonexpansive mappings; Strictly convex spaces; Weakly inward maps

1. Introduction

Let K be a nonempty subset of a normed linear space, E. A mapping $T: K \to E$ is called *nonexpansive* if $||Tx - Ty|| \le ||x - y||$ for all $x, y \in K$. In [5], Kirk introduced an iterative process given by

$$x_{n+1} := a_0 x_n + a_1 T x_n + a_2 T^2 x_n + \dots + a_r T^r x_n,$$
(1.1)

where $a_i \ge 0$, $a_0 > 0$ and $\sum_{i=0}^r a_i = 1$, for approximating fixed points of nonexpansive mappings on convex subset of uniformly convex Banach spaces. Maiti and Saha [9] extended the results of Kirk [5].

Let K be a nonempty closed convex and *bounded* subset of a real Banach space E. Let $T_i: K \to K (i = 1, 2, ..., r)$ be nonexpansive mappings and let

$$S := a_0 I + a_1 T_1 + a_2 T_2 + \dots + a_r T_r, \tag{1.2}$$

E-mail addresses: habtuzh@yahoo.com (H. Zegeye), nshahzad@kau.edu.sa (N. Shahzad).

0096-3003/\$ - see front matter © 2007 Published by Elsevier Inc. doi:10.1016/j.amc.2007.02.072

^{*} Corresponding author.