

HALPERN-TYPE PROXIMAL POINT ALGORITHM IN CAT(0) SPACES

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ABSTRACT. A method which is a combination of the Halpern method and proximal point method (PPA) is introduced in this paper. It is proved that the sequence of iterates generated by our method converges strongly to a point which is a common solution to some monotone inclusion problem and fixed point problem in CAT(0) spaces under some appropriate conditions.

1. Introduction

Let X be a metric space and C be a nonempty closed and convex subset of X . A point $x \in C$ is called a fixed point of a nonlinear mapping $T: C \rightarrow C$, if

$$(1.1) \quad Tx = x.$$

The set of fixed points of T is denoted by $F(T)$. Some results on fixed point theory in convex metric spaces can be found in [10], [14], [20], [27], [29], [30], [33], [36], [39]. Let $A: X \rightarrow 2^{X^*}$ be a monotone operator, the monotone inclusion problem (MIP in short) is to find

$$(1.2) \quad x \in \mathbb{D}(A) \text{ such that } 0 \in Ax.$$

The solution set of problem (1.2) is denoted by $A^{-1}(0)$, which is known to be closed and convex (see [41, Remark 3.1]).

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