CQ METHOD FOR APPROXIMATING FIXED POINTS
OF NONEXPANSIVE SEMIGROUPS
AND STRICTLY PSEUDO-CONTRACTION MAPPINGS

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ABSTRACT. We use the CQ method for approximating a common fixed
point of a left amenable semigroup of nonexpansive mappings, an in-
finite family of strictly pseudo-contraction mappings and the set of solu-
tions of variational inequalities for monotone, Lipschitz-continuous map-
pings in a real Hilbert space. Our results are a generalization of a result
announced by Nadezhkina and Takahashi [N. Nadezhkina and W. Taka-
hashi, Strong convergence theorem by a hybrid method for nonexpansive
mappings and Lipschitz-continuous monotone mappings, SIAM J. Optim.
16 (2006), 1230-1241] and some other recent results.

1. Introduction

Let $H$ be a real Hilbert space with inner product $\langle \cdot , \cdot \rangle$ and induced norm
$\| \cdot \|$. Let $C$ be a nonempty closed convex subset of $H$. A mapping $T$ of $C$ into
itself is called nonexpansive if $\| Tx - Ty \| \leq \| x - y \|$, for all $x, y \in C$. By $\text{ne}(C)$,
we denote the set of all nonexpansive mappings of $C$ into itself and by $\text{Fix}(T)$,
we denote the set of fixed points of $T$ (i.e. $\text{Fix}(T) = \{ x \in C : Tx = x \}$), it is
well known that $\text{Fix}(T)$ is closed and convex. Let $A : C \to H$ be a nonlinear

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