Relaxed Inertial Algorithms for Monotone Inclusion Problems

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Starting with the quite difficult monotone operator inclusion problem

$$0 \in Ax + Dx + N_C(x),$$

where $\mathcal{H}$ is a Hilbert space, $A, B : \mathcal{H} \rightrightarrows \mathcal{H}$ are two maximally monotone operatos, $D : \mathcal{H} \to \mathcal{H}$ is an $\eta-$ cocoercive operator with $\eta > 0$ and $C := zerB \neq \emptyset$, we present both inertial and relaxed inertial algorithms converging to a solution, by using an iterative scheme.

Such algorithms have been analyzed previously in [2], but without the inertial effect. By imposing such an inertial effect, like in [1] we obtain the advantage of a faster converge. The convergence of the generated sequence of iterates to a solution of the monotone inclusion problem is proved under a condition expressed via the Fitzpatrick function of B. Our algorithm improves and corrects some of the results in [2].

A relaxation is further applied to the inertial algorithm (and it consists in the introduction of a new sequence), thus obtaining a version of the algorithm which extends the very recent results in [3].

References

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