Monotone inclusions through inertial algorithms

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This presentation contains an algorithm which solves a monotone inclusion problem of the form:

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

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 $\eta-$ cocoerci e operator with $\eta > 0$ and $C := zerB \neq \emptyset$.

The iterative scheme developed evaluates an appropriate penalization of the operator B via a backward step and is endowed with inertial effects. 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.

Iterative schemes with inertial effects have their roots in the implicit discretization of a differential system of the second order. For them, the new iterate is defined by making use of the previous two iterates. In minimization problems inertial algorithms lead to optimal solutions that cannot be detected by their non-inertial variants.

References

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