Convergence of remote projections onto convex set

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We try to find a point in the intersection of closed convex sets by iterating the nearest point projection onto them. This works, if the sets are symmetric and we always project on the most distant set. We will discuss to what extent this assumptions can be dropped.

Let $\{C_\lambda\}_{\lambda \in \Lambda}$ be a family of closed and convex sets in a Hilbert space H. Assume the sets C_λ are also symmetric and $\{x_n\}_{n \in \mathbb{N}}$ is a sequence of remote projections onto them. This means, $x_0 \in H$, and x_{n+1} is the projection of x_n onto the most distant set C_λ. Then the sequence $\{x_n\}$ converges to a point in the intersection $\bigcap_{\lambda \in \Lambda} C_\lambda$. We give examples explaining to what extent the symmetry condition on the sets C_λ can be dropped.

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