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Summary: Let $E$ be a real smooth and uniformly convex Banach space, and $E^*$ its duality space. Let $A \subset E \times E^*$ be a maximal monotone operator with $A^{-1}\{0\} \neq \emptyset$. A new iterative scheme is introduced which is proved to be weakly convergent to a zero point of the maximal monotone operator $A$ by using the techniques of Lyapunov functional, $Q_r$ operator and generalized projection operator, etc.

MSC:

47J25 Iterative procedures involving nonlinear operators
47H05 Monotone operators and generalizations
47H09 Contraction-type mappings, nonexpansive mappings, $A$-proper mappings, etc.

Keywords:

Lyapunov functional; maximal monotone operator; uniformly convex Banach space