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Critical point methods. (English) Zbl 1157.35050

Nonlinear Anal., Theory Methods Appl., Ser. A, Theory Methods 69, No. 3, 987-999 (2008).

The author presents a survey of abstract approaches to the problem of existence of critical points of a C^1 -functional G defined on a Banach space E . More precisely, he explains how one obtains a Cerami sequence for G in various settings. A Cerami sequence for G is a sequence $(u_n) \subseteq E$ such that, for some $c \in \mathbb{R}$, $G(u_n) \rightarrow c$ and $(1 + \|u_n\|)\|G'(u_n)\| \rightarrow 0$. In relevant examples, this leads to the existence of a critical point of G with functional value c . The use of Cerami sequences instead of Palais-Smale sequences poses no restrictions, but gives better results in the applications.

At first, the author gives a brief review of his recent results on sandwich Pairs. Then he develops min-max theorems from an abstract point of view, and explains some applications to semilinear elliptic boundary value problems.

Reviewer: Nils Ackermann (México)

MSC:

35J65 Nonlinear boundary value problems for linear elliptic equations

Cited in 1 Document

58E05 Abstract critical point theory (Morse theory, Lyusternik-Shnirel'man theory, etc.) in infinite-dimensional spaces

49J35 Existence of solutions for minimax problems

35J20 Variational methods for second-order elliptic equations

Keywords:

critical point theory; Palais-Smale sequence; Cerami sequence; sandwich pair; min-max theorem

Full Text: [DOI](#)

References:

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- [3] Schechter, M., New linking theorems, *Rend. sem. mat. univ. Padova*, 99, 255-269, (1998) · [Zbl 0907.35053](#)

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