

סמינר במדעי היסוד

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אוניברסיטת תל-אביב

The Directed Subdifferential of Differences of Convex functions

תקציר

The results reported are obtained jointly with Robert Baier (University of Bayreuth).

Subdifferentials (generalized gradients) are sets which replace gradients of non-smooth functions. After the classical convex subdifferential of convex functions from the middle of the 20-th century, a variety of subdifferentials have appeared and have been involved in optimality conditions for non-smooth and non-convex functions.

We introduce a new "directed subdifferential" for DC functions (differences of convex functions) on \mathbb{R}^n , as the "directed difference" of two convex subdifferentials. This "directed set" lives in a Banach space, in which the convex compact subsets of \mathbb{R}^n are embedded, and obeys basic axioms of subdifferentials. It is visualized as a (generally non-convex) set which is a subset of most known subdifferentials (as the Clarke's and Michel-Penot subdifferentials).

Nice calculus rules are advantageous for the proposed subdifferential, as well as its graphical visualization. The visualization helps to distinguish minimizers from maximizers and saddle points, and to identify directions of descent and ascent.

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