KURDYKA-LOJASIEWICZ INEQUALITY AND SUBGRADIENT TRAJECTORIES: THE CONVEX CASE

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In his talk, Jérôme Bolte gave some characterizations of the Kurdyka-Lojasiewicz inequality by means of some properties of the gradient flow. Here, we make more precise this link for convex functions $f : H \to \mathbb{R}$, where H is a Hilbert space. Then, we answer in a negative way the following question: does a convex function always satisfy the Kurdyka-Lojasiewicz inequality? It is true if, for example, the convex function satisfies a growth condition from above around its minima. But it is false in general and we describe a counter-example of a smooth convex function $f : \mathbb{R}^2 \to \mathbb{R}$ which does not satisfy Kurdyka-Lojasiewicz inequality.

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