Sweeping processes with regular and nonregular sets

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Abstract

In this talk, we discuss about *sweeping process*, which is a first-order dynamical system involving normal cones to moving sets. Due to its versatility as a mathematical model, it has been used in different applications such as electrical circuits, contact mechanics, crowd motion, hysteresis phenomena, soft crawlers, etc. Furthermore, the sweeping process has motivated the use of differential inclusions with normal cones, which has allowed the study of new variants of the sweeping process. We also present the so-called degenerate sweeping processes. Specifically, we focus on the *perturbated degenerate state-dependent sweeping processes*. This dynamical system, proposed by Kunze and Monteiro-Marques in [1], is an important model for quasistatic problems in contact mechanics. The degenerate sweeping process has been studied by several authors in the context of convex and prox-regular sets. In recent works [2, 3], by means of the Moreau-Yosida regularization technique, we obtain well-posedness in the framework of nonregular sets. We fill an important gap in the literature and provide applications to online optimization.

References

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