

# On the optimal control of Moreau's sweeping process

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## ABSTRACT

Finding necessary optimality conditions for Moreau's sweeping process with a controlled drift, namely the evolution inclusion

$$\dot{x} \in -N_C(x) + f(x, u), \quad u \in U \tag{1}$$

is a rather new challenging topic in the mathematical theory of control, that is motivated by some applications (e.g., to robotics or to nonsmooth electric circuits). The main difficulty is due to the discontinuity of the dynamics with respect to the state variable  $x$ , that appears through the normal cone  $N_C(x)$  to the closed (convex) set  $C$  at  $x \in C$ . The kinematic meaning of (1) will be first illustrated. Then some methods for deriving necessary conditions for (e.g.) a minimizer of a Mayer problem for trajectories of (1) will be presented, together with their pro's and con's.