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**OPTIMAL CONTROL OF FREE-TIME SWEEPING PROCESSES WITH
APPLICATIONS**

BORIS MORDUKHOVICH

This talk is devoted to a novel class of optimal control problems governed by the so-called sweeping (or Moreau) processes that are described by discontinuous dissipative differential inclusions with free time. Although such dynamical processes, strongly motivated by applications, have appeared in 1970s, optimal control problems for them have been formulated quite recently and occurred to be rather complicated from the viewpoint of developing control theory. Their study and applications require advanced tools of variational analysis and generalized differentiation, which will be presented in the lectures. Combining this machinery with the method of discrete approximations leads us deriving new necessary optimality conditions and their applications to practical models in elastoplasticity, traffic equilibria, robotics, etc.

Based on joint research with Giovanni Colombo (University of Padova), Dau Nguyen (San Diego State University), and Trang Nguyen (South Dakota State University).

DEPARTMENT OF MATHEMATICS, WAYNE STATE UNIVERSITY, USA, EMAIL: example@mat.com.