

# Variational analysis and optimal control of semilinear evolution and partial differential inclusions

BORIS S. MORDUKHOVICH

Department of Mathematics  
Wayne State University  
Detroit, Michigan 48202  
*e-mail*: boris@math.wayne.edu

## Abstract

This talk is devoted to variational analysis of optimal control problems governed by constrained semilinear evolution inclusions with infinite-dimensional state spaces and their applications to dynamic optimization of control systems described by partial differential inclusions and equations. Our variational analysis is based on the method of discrete approximations and advanced tools of generalized differentiation, which allow us to derive pointwise necessary optimality conditions of the Euler-Lagrange type under natural assumptions. As a by-product of these developments, we establish efficient conditions ensuring the well-posedness of discrete approximations for general control problems for systems with distributed parameters. The results obtained are specified in the case of optimal control problems governed parabolic inclusions with endpoint constraints.