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Nota di contenuto	Foreword -- On Degenerate Cycles in Planar Filippov Systems -- Sliding Dynamics on Codimension-2 Discontinuity Surfaces -- Asynchronous Networks -- Regularization by External Variables -- Characterizing Tipping in a Stochastic Reduced Stommel-Type Model in Higher-Dimensions -- Global Bifurcations in a Class of Discontinuous Piecewise Linear Systems -- Single-Impact Orbits near Grazing Periodic Orbits for an Impact Oscillator -- A Choice between Smooth and Nonsmooth Models -- Sliding Mode Control of Heterogeneous Systems -- Limit Cycle Bifurcation from a Persistent Center at Innity in 3D Piecewise Linear Systems with Two Zones -- Alternating Smooth and Nonsmooth Bifurcations in a Discontinuous Linear-Power Map -- Extending Slow Manifolds Near a Degenerate Transcritical Intersection in Three Dimensions -- Less is More I: a Pessimistic View of Piecewise Smooth Bifurcation Theory -- Less is More II: An Optimistic view of Piecewise Smooth Bifurcation Theory -- On Semi-Local Structural

Stability of Filippov Systems -- Nonlinear Estimation of Synaptic Conductances Via Piecewise Linear Systems -- Integral Curves of a Vector Field with a Fractal Discontinuity -- Why Nonsmooth? -- An Update on That Singularity -- Sensor Effects in Sliding Mode Control of Power Conversion Cells -- Variational Time Stepping for Nonsmooth Analytical System Dynamics -- The chaotic behavior of piecewise smooth dynamical systems on torus and sphere -- Non-Smooth Hopf-Type and Grazing Bifurcations Arising from Impact/Friction Contact Events -- Number of Limit Cycles for some Non-Generic Classes of Piecewise Linear Differential Systems -- An Equivalent Formulation of the Averaged Functions Via Bell Polynomials -- Smoothing a Piecewise-Smooth: An Example from Plankton Population Dynamics -- A Note on Frictional Slip Patterns -- Climate in Barcelona is Wonderful -- Open Problems on Border-Collision Bifurcations -- Nonsmooth Maps and the Fast-Slow Dynamics of Sleep-Wake Regulation: Part I -- Nonsmooth Maps and the Fast-Slow Dynamics of Sleep-Wake Regulation: Part II -- Comments for the Continuation Method by A.F. Filippov for Discontinuous Systems, Part I -- Comments for the Continuation Method by A.F. Filippov for Discontinuous Systems, Part II -- Challenges from System Dynamics to Complexity and Piecewise-Deterministic Markov Processes: Market Modeling.

Sommario/riassunto

This volume contains extended abstracts outlining selected talks and other selected presentations given by participants throughout the "Intensive Research Program on Advances in Nonsmooth Dynamics 2016", held at the Centre de Recerca Matemàtica (CRM) in Barcelona from February 1st to April 29th, 2016. They include brief research articles reporting new results, descriptions of preliminary work or open problems, and outlines of prominent discussion sessions. The articles are all the result of direct collaborations initiated during the research program. The topic is the theory and applications of Nonsmooth Dynamics. This includes systems involving elements of: impacting, switching, on/off control, hybrid discrete-continuous dynamics, jumps in physical properties, and many others. Applications include: electronics, climate modeling, life sciences, mechanics, ecology, and more. Numerous new results are reported concerning the dimensionality and robustness of nonsmooth models, shadowing variables, numbers of limit cycles, discontinuity-induced bifurcations and chaos, determinacy-breaking, stability criteria, and the classification of attractors and other singularities. This material offers a variety of new exciting problems to mathematicians, but also a diverse range of new tools and insights for scientists and engineers making use of mathematical modeling and analysis. The book is intended for established researchers, as well as for PhD and postdoctoral students who want to learn more about the latest advances in these highly active areas of research.