1156-49-201 **Peter Stechlinski*** (peter.stechlinski@maine.edu), Department of Mathematics and Statistics, University of Maine, Orono, ME. *Sensitivity analysis for nonsmooth dynamical systems.*

Nonsmooth dynamical systems exhibit hybrid-like behavior (i.e., a mixture of continuous and discrete) and are broadly applicable, with motivating problems found in systems biology, atmospheric chemistry, and process systems engineering, among others. Formalisms of this modeling framework include nonsmooth ODEs (i.e., those with nonsmooth right-hand side functions), nonsmooth differential-algebraic equations, optimization-constrained differential equations, and complementarity systems. However, conventional treatments of these models may fail because of the presence of nonsmoothness. Sensitivity analysis is presented for this modeling framework, using recent advancements in generalized derivatives theory. Mirroring classical results, nonsmooth sensitivity systems can be derived whose solutions characterize (local) sensitivity information. Numerical implementations of the theory are practical, with the sensitivity information furnished from this approach suitable for use in dedicated nonsmooth numerical methods (e.g., equation-solving) and large-scale dynamic optimization. (Received January 23, 2020)