

Bingwu Wang (bwang@emunix.emich.edu), Department of Mathematics, Eastern Michigan University, Ypsilanti, MI, *Generalized Differentiation for Moving Objects*

This work is devoted to the analysis of moving sets and mappings commonly arising in control and optimization theory. We summarize, unify, and generalize some of the known concepts in this area, such as extended normal cone, extended coderivative and extended subdifferential, which are natural generalizations of the corresponding normal cone, coderivative and subdifferential for the case of non-moving objects, respectively. In addition, we propose a new notion of sequential normal compactness for the moving objects. We then establish a complete calculus for our constructs, under the assumption of sequential normal compactness. We also develop a full set of calculus rules for the extended normal compactness that is crucial for applications to optimization and control theory. We illustrate how most results for the non-moving situations can be generalized to the moving case. Our main tool is a fuzzy intersection rule based on the extremal principle. The work is inspired by recent results in control and optimization by Boris Mordukhovich, Jay Treiman, Qiji Zhu, and others.

This talk is based on joint work with Boris Mordukhovich.