

The set order topology : a new topological framework designed for set-valued optimization

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In this work, we introduce a topology on $\mathcal{P}(Z)$, the power set of a partially ordered normed space Z , from which we derive a topological convergence on $\mathcal{P}(Z)$ as well as new concepts of continuity and semicontinuity for set-valued mappings. Our goal is to propose a new and appropriate framework for set-valued optimization problems involving order relations induced by a cone on the objective set. Taking advantage of this new framework, we then establish several results concerning the well-posedness of set-valued optimization problems that remain consistent with the state of the art. We also show the practicality of this new theory through a result in which we establish the well-posedness of the set-valued portfolio investment problem obtained in our topological framework.

Références

- [1] Geoffroy, M. H., & Larrouy, J. (2022). A New Topological Framework and Its Application to Well-Posedness in Set-Valued Optimization. *Numerical Functional Analysis and Optimization*, 43(16), 1848–1883. <https://doi.org/10.1080/01630563.2022.2141254>