

Dixièmes Journées Franco-Chiliennes d’Optimisation
INSA Rouen Normandie, Rouen, France
8-11 July 2025

NEW INSIGHTS INTO MOREAU’S SWEEPING PROCESSES

EMILIO VILCHES

The sweeping process is a first-order differential inclusion involving the normal cone to a family of moving sets. It was introduced by J.J. Moreau in the early seventies to address an elastoplastic problem. Since then, it has been used to model constrained dynamical systems, nonsmooth electrical circuits, crowd motion, mechanical problems, and other applications.

The aim of this talk is twofold. On the one hand, we will provide the main insights into the well-posedness of the sweeping process, and on the other hand, we will present the latest developments in the subject, such as optimal control and numerical approximation.

This talk is based on the papers [1, 2, 3].

REFERENCES

- [1] J.G. GARRIDO AND E. VILCHES *Catching-up Algorithm with Approximate Projections for Moreau’s Sweeping Processes*, J. Optim. Theory Appl., 2024.
- [2] J.G. GARRIDO, M. LIOI AND E. VILCHES *Inexact Catching-Up Algorithm for Moreau’s Sweeping Processes*, Submitted, 2025.
- [3] C. HERMOSILLA, M. PALLADINO AND E. VILCHES *Hamilton-Jacobi-Bellman approach for optimal control problems of sweeping processes*, Appl. Math. Optim., 2024.

INSTITUTO DE CIENCIAS DE LA INGENIERÍA, UNIVERSIDAD DE O’HIGGINS, CHILE, EMAIL: emilio.vilches@uoh.cl.