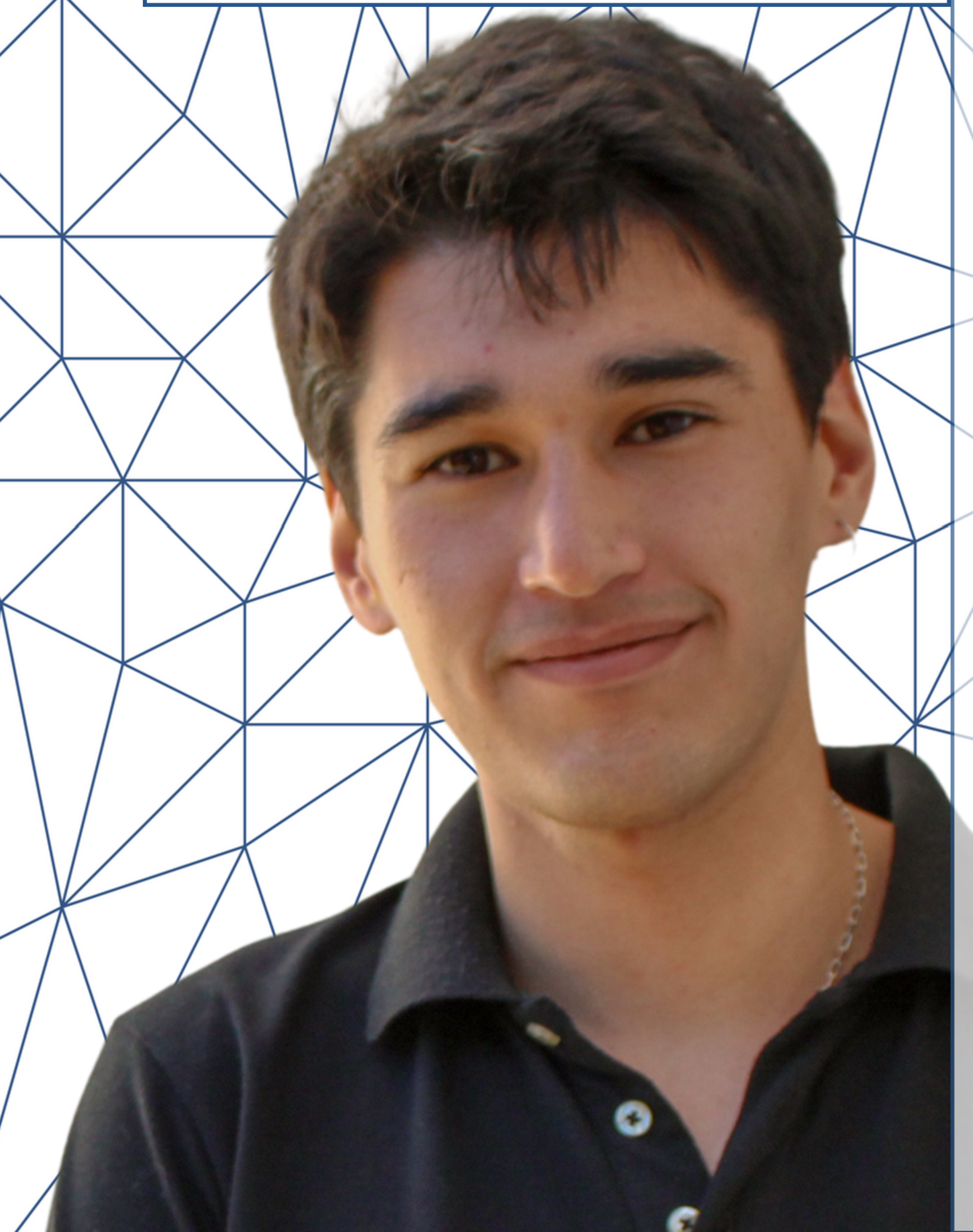
Centro de Investigación en Ingeniería Matemática

Seminario de Análisis Numérico y Modelamiento Matemático de Estudiantes



Rockafellian relaxation for PDE-constrained optimization under uncertainty in the context of risk measures

In this talk, we propose a new approach to Rockafellian relaxation in the context of PDE-constrained optimization under data corruption and uncertainty. While recent advances have primarily focused on expectation-based corrupted optimization problems [1], we extend the analysis to a broader class involving conditional value-at-risk (CVaR) [5, 4] and develop a more comprehensive theory. Within this framework, we first introduce a unified formulation that simultaneously accounts for two distinct types of corruption. Second, we establish new existence results and derive first-order optimality conditions using a smoothing technique [3]. Third, we strengthen the convergence analysis, clarifying the relationship between corrupted and uncorrupted solutions. Although the discussion will focus on finite-dimensional sample spaces of finite measure, we also provide insights into natural extensions of the theory to infinite-dimensional measure spaces, without relying on the standard finite-dimensional noise assumption.
This is a joint work with Harbir Antil, Sean Carney, and Benjamín Venegas.

References

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