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Optimization and Equilibrium Seminar

Speaker 1: Fernanda Urrea
Affiliation: Institut National des Sciences Appliquées de Rouen, France
Title: Analysing necessary optimality conditions for a time optimal control problem in Wasserstein spaces
Abstract: We are interested in developing necessary optimality conditions in the form of a Pontryagin maximum principle for the minimal time Bolza optimal control problem with constraints in the final time. In this problem, the dynamic is given by a non-local continuity equation in the Wasserstein space of probability measures, the set of controls are taken in open-loop form and the set of constraints is represented by functional inequalities applied to the terminal time. To this end, we relate the main challenges of this problem from which a fair amount is accounted by the fact that Wasserstein spaces are not Banach and hence its difficulties on defining differentiability.

Speaker 2: Rodrigo Maulén
Affiliation: Ecole Nationale Supérieure d'Ingénieurs de Caen (ENSICAEN), France
Title: An SDE perspective on stochastic convex optimization
Abstract: We analyze the global and local behavior of gradient-like flows under stochastic errors towards the aim of solving convex optimization problems with noisy gradient input. We first study the unconstrained differentiable convex case, using a stochastic differential equation where the drift term is minus the gradient of the objective function and the diffusion term is either bounded or square-integrable. In this context, under Lipschitz continuity of the gradient, our first main result shows almost sure weak convergence of the trajectory process towards a minimizer of the objective function. We also provide a comprehensive complexity analysis by establishing several new pointwise and ergodic convergence rates in expectation for the convex, strongly convex, and (local) Lojasiewicz case. The latter, which involves local analysis, is challenging and requires non-trivial arguments from measure theory. Then, we extend our study to certain nonsmooth situations. We show that several of our results have natural extensions obtained by replacing the gradient of the objective function by a cocoercive monotone operator. Finally, we show that using a time rescaling and averaging technique we can obtain results for a stochastic version of the Inertial System Implicit Hessian Damping (ISIHD).

Link de zoom:
https://reuna.zoom.us/j/5185702306?pwd=cEtaeGVqUk1ZY0lkQ2Z0WU4yNlFmUT09

Miércoles 20 de Diciembre de 2023, a las 16:15 Hrs.
Sala de Seminarios John Von Neumann del Centro de Modelamiento Matemático (Beauchef 851, Edificio Norte, Piso 7).