



Programa Jornada Científica CIRIC – Inria Chile

Fecha: Martes 18 de Agosto de 2015.

Lugar: Centro de Innovación UC
Campus San Joaquín, Pontificia Universidad Católica de Chile
Avda Vicuña Mackenna 4860, San Joaquín

14:00 - 14:20 Recepción

14:20 - 15:00 Claude Puech, Director Ejecutivo Inria Chile

"Inria Chile, centro para la innovación en Tecnologías de la Información y de la Comunicación en Chile"

15:00 - 15:30 Alejandro Jofré, Académico Universidad de Chile y Coordinador EP Gestión y Optimización de la Energía de CIRIC – Inria Chile

“Cost-minimizing mechanisms for a wholesale electricity market game”

Abstract: We consider a short-term wholesale electricity market model with general networks, quadratic transmission losses and energy producers playing strategically. Previous works by Escobar and Jofré show how regulation mechanisms such as the case when prices correspond to the Lagrange multipliers of a centralized cost minimization program allow the producers to charge significantly more (market power) than marginal price. In this paper we consider an incomplete information setting where the cost structure of a producer is partially unknown to both its competitor and the regulator, which corresponds to a MPEC with asymmetric information. We derive an optimal regulation mechanism, and compare its performance to the “price equal to Lagrange multiplier” mechanism from the numerical and analytical point of view.

15:30 - 16:00 Soledad Torres, Académica U. Valparaíso e investigadora del EP Análisis Estocástico de Energías Renovables de CIRIC – Inria Chile

“Optimal choice of locations for wind farms in the Region of Valparaiso”



16:00 - 16:30 Pause café

16:30 - 17:00 Maximiliano Olivares, Ingeniero del EP Bioprocesos y Gestión de Recursos Naturales de CIRIC – Inria Chile

“Quantitative tools for a sustainable development of fisheries and the recovery of overexploited marine resources”

Abstract:

Nearly a half of the main Chilean fisheries are overexploited or depleted. This is not only an environmental or economic issue, it is also important to consider the social aspects of fisheries. In this talk, we present the development of quantitative tools based on discrete-time dynamics, viable-control approach and optimization techniques to assist the stakeholders about sustainable issues related to fisheries exploitation and conflicting objectives (production/preservation), helping the process of decision making.

17:00 - 17:30 Vincent Acary, Investigador de CIRIC – Inria Chile

"The nonsmooth contact dynamics method for the simulation of granular matter flows and fracture in mining applications"

Abstract:

In this talk, we propose an overview of the main features of the nonsmooth contact dynamics method for the modeling and the simulation of large collections of mechanical bodies in interaction through frictional contact interfaces, possibly with cohesive zone models and impacts. This particular numerical method is based on a nonsmooth framework that calls for nonsmooth and convex analysis and numerical optimization. The measure differential dynamics is numerically solved in time with a dedicated event-capturing time-stepping scheme, the Moreau-Jean scheme, that allow for a large number of events in time and possibly finite accumulation of impacts. The frictional contact behavior is modeled as a second--order cone complementarity problem that is solved mainly through iterative methods. The goal in this talk is to review the main principles of the design of the method and its qualitative characteristics and to show how it can be useful in mining applications. Two main directions are in current development: the granular flows of ore in hoppers and silos and the process of rock fracture in block caving technique.



17:00 - 17:30 Eduardo Moreno, Académico U. Adolfo Ibáñez e Investigador del EP
Soporte de Decisiones para Problemas Industriales de CIRIC – Inria Chile

“Using Direct Optimization for Deterministic, Robust and Stochastic Open Pit Production Scheduling”

Abstract:

Given a block-model of an open cut mine, a production schedule defines which blocks should be extracted, when to extract them, and what to do with them once extracted. Recent developments have made the IP formulation of this problem computationally viable in real-sized instances. In this talk, we present these developments, and we show how to embed different mining problems into this framework. We also present how this approach can be adapted to consider grade and prices uncertainties, allowing solving robust and two-stage stochastic problem up to near-optimality on real-sized problems.