Rocky Mountain INFORMS: Save the Date - April 29, 2021

The Rocky Mountain INFORMS Chapter is pleased to host Professor Marcos Goycoolea, who holds a Ph.D. in Industrial and Systems Engineering from Georgia Institute of Technology. He specializes in large-scale integer programming, and has worked on cutting-plane methods, the traveling salesman problem, and applications in forestry, transportation and mining. Currently, he is collaborating with academic and industry partners to develop optimization techniques for strategic mine planning. Together with colleagues and former students in Chile, he has recently launched a small start-up Alicanto Labs, that aims to transfer successful research ideas to the mining industry. Alicanto Labs and Deswik recently launched Deswik.GO, a new optimization product for open pit mine planning. Marcos teaches operations management, supply chain and descriptive analytics to MBA and masters students at Universidad Adolfo Ibáñez, in Santiago, Chile.

Title Strategic and Tactical Planning for Underground Mines

Abstract Strategic and tactical planning for underground mines is a challenging optimization problem. Unlike in open pit mining, there are no widely available software systems to tackle this problem, making it necessary to rely on heuristics and manual computations. This problem, which consists of scheduling activities with different lengths over time, subject to precedence and resource availability, is known in the academic literature as the Resource Constrained Project Scheduling Problem, or RCPSP. Short of the Traveling Salesman Problem, it is one of the most-studied problems in Operations Research. However, the focus of the academic community has been on solving small, very dense problems (< 120 jobs) to optimality. In mining, problems tend to be very large ($> 15,000$ activities), yet fortunately, also very sparse. In this talk, we present new methodologies, and illustrate their effectiveness on a test bed of twelve real planning instances. Specifically, we show that (with some tweaks), classical methodologies can actually produce reasonable solutions for these problems (8% gap), but take many days to do so. By extending and combining classical methodologies (constraint programming, list scheduling) with new ideas (Bienstock-Zuckerberg algorithm, improved list scheduling techniques, dynamic aggregation), we are able to compute near-optimal solutions (2-4% gap) to these problems in just a few hours.

ZOOM DETAILS:
Topic: Rocky Mountain INFORMS Chapter - Marcos Goycoolea
Time: Apr 29, 2021 6:00 PM Mountain Time (US and Canada)

Join from PC, Mac, Linux, iOS or Android:
`https://mines.zoom.us/j/94851369365?pwd=NHlWN0lvZjllWXFDYytVZ3piVnU3dz09`
Password: 423866

Or iPhone one-tap: 13462487799,94851369365# or 16699006833,94851369365#

Or Telephone:
Dial: +1 346 248 7799 (US Toll) or +1 669 900 6833 (US Toll)
Meeting ID: 948 5136 9365
International numbers available: https://mines.zoom.us/u/ac1CFaFGAi

Or a H.323/SIP room system:
H.323: 162.255.37.11 (US West) or 162.255.36.11 (US East)
Meeting ID: 948 5136 9365
Password: 423866

SIP: 94851369365@zoomcrc.com
Password: 423866