INSTRUCTORS

Roussos Dimitrakopoulos is a Professor and Canada Research Chair (Tier I) in Sustainable Mineral Resource Development and Optimization under Uncertainty, and Director, COSMO - Stochastic Mine Planning Laboratory. He holds a PhD from École Polytechnique de Montréal and an MSc from the University of Alberta. He works on risk-based simulation and stochastic optimization in mine planning and production scheduling, the simultaneous optimization of mining complexes and mineral value chains under uncertainty. He has taught short courses and worked in Australia, North America, South America, Europe, the Middle East, South Africa and Japan. He received the Synergy Award of Innovation in 2012 by the Governor General of Canada for research contributions to mining science and engineering and his long-standing partnership with AngloGold Ashanti, Barrick Gold, BHP, De Beers, IAMGOLD, Kinross Gold, Newmont Goldcorp and Vale. In 2013, he received AIME's Mineral Economics Award, and was a CIM distinguished lecturer in 2015-2016.

Ryan Goodfellow is currently a Technical Specialist in Mine Optimization at Newmont Goldcorp, in Denver, CO, USA. At Newmont, his role is to implement new optimization workflows at Newmont's worldwide operations to unlock hidden value. Previously, Ryan was a research fellow for COSMO – Stochastic Mine Planning Laboratory at McGill University, where he received a PhD in Mining and Materials Engineering. His research focuses on developing advanced models and concepts for the integrated optimization of mining complexes with uncertainty and developing computationally efficient solution methods. His expertise includes major industrial applications in Au, Cu and Ni laterite deposits. Ryan represents the next generation of mining professionals, its up-to-date smart computing technologies and innovative thinking.

VENUE DETAILS

Ryerson University - International
Living & Learning Centre
240 Jarvis Street
Room 212 via elevator number 3
Toronto, Ontario M5B 2L1 Canada

LOGISTICS

Lectures are given from 9 AM (refreshments at 8:30 AM) to 5 PM with two 15 minute coffee breaks and a 1 hour lunch break.

COSMO

cosmo.mcgill.ca

COSMO - Stochastic Mine Planning Laboratory, a global center for leading-edge research and graduate education in "orebody modelling and strategic mine planning with uncertainty", is supported by AngloGold Ashanti, Barrick Gold, BHP, De Beers, IAMGOLD, Kinross Gold, Newmont Goldcorp, Vale, and the Canada Research Chairs Program, NSERC, and CFI.

PROFESSIONAL DEVELOPMENT SERIES   2020
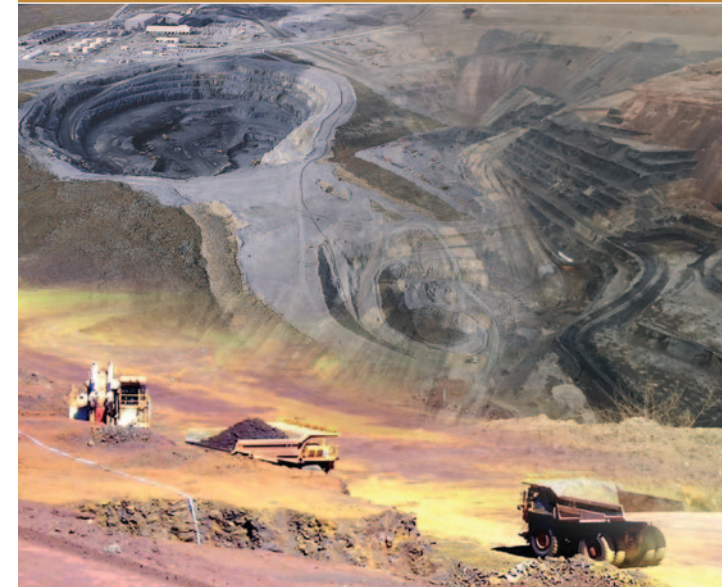
STRATEGIC RISK QUANTIFICATION
& MANAGEMENT FOR ORE RESERVES & MINE PLANNING

STRATEGIC MINE PLANNING WITH NEW DIGITAL TECHNOLOGIES, RISK MANAGEMENT AND MINERAL VALUE CHAINS

Roussos Dimitrakopoulos
McGill University, Canada

Ryan Goodfellow
Newmont Goldcorp, USA

January 29-31, 2020
Toronto, Ontario, Canada

CIM ICM   SME Society for Mining, Metallurgy & Exploration   AusIMM THE MINERALS INSTITUTE   SAIMM   COSMO

OBJECTIVES AND CONTENT

At the time of a continuing rebound of metal markets, learn how the application of new digital technologies that can add substantial value to strategic mine planning and asset valuation. The new technologies and related tools integrate technical risk management while capitalizing on the synergies amongst the elements of mineral value chains through their simultaneous optimization – from mines to products to markets.

Learn how you can improve performance by:

- Learning the state-of-the-art strategic mine planning concepts and new approaches that unlock and add value to mining assets
- Finding out how to minimize technical risks and produce optimal pit designs with strategic mine planning processes and the next generation optimization methods
- Discovering methods and tools for the simultaneous risk-managing (stochastic) optimization of mining complexes and mineral value chains from mines to products to markets
- Discovering how the new developments will help you capture the "upside potential" in mine plans and minimize "downside risks", as well as increase cash flows
- Exploring and learning from real-world examples, practices and comparisons in diverse applications, from gold and copper mines to iron ore and nickel laterites
- Understanding how to deal with blending and non-linear geo-metallurgical interactions in the processing streams, as materials are transformed from bulk material to refined products
- Participating in hands-on computer sessions that show how to increase project value by employing new risk-managing simultaneous optimization models

PLEASE NOTE:

It is strongly recommended that participants bring a laptop.

COURSE OUTLINE

Introduction - Foundational Concepts, Techniques and Limits

- Strategic mine planning and optimal strategy
- Integrated optimization – the bigger picture
- Technical risk management adds value and shelters investment
- Ultimate pit limits, phase design and life-of-mine production schedule optimization
- Cut-off grade optimization and the role of stockpiles
- Limits of conventional approaches: need for risk management and integrated models

Risk Quantification and Introducing a New Mine Planning Paradigm

- Breaking down silos: models of mineral deposits and mine planning optimization
- Understanding how to quantify and utilize grade/tonnage/metal uncertainty and variability
- Intuitive introduction to Monte Carlo simulations and risk assessment
- Stochastic optimization methods and mine planning: concepts and uncovering additional value

Simultaneous Stochastic Optimization of a Mining Complex
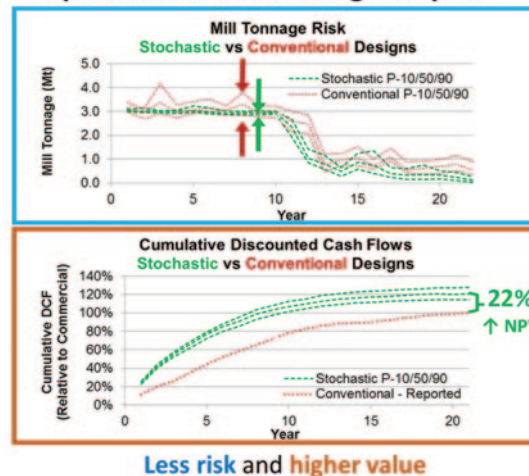
Risk Management in Mine Planning: Less Risk and Higher NPV

- Pit design and production scheduling with simulated orebodies
- Stochastic pit limits are larger and pushback design with grade uncertainty
- Risk based optimal design for sublevel open stoping, and lessons learned
- Product quality management and production scheduling with simulated deposits
- Stochastic production scheduling application and comparison to conventional scheduling

The Next Level: Mining complexes and Mineral Value Chains

- Mining complexes - mineral value chains and new smarter digital technologies
- Simultaneous optimization of mining complexes from pit to port with geological (supply) uncertainty, stockpile and blending optimization, processing and CAPEX options.
- Industry examples and comparisons: diverse applications from gold and copper mines to iron ore and nickel laterite
- Blending and non-linear geo-metallurgical interactions in processing streams as materials are transformed from bulk material to refined products
- Dealing with exceptionally large mining complex optimization models
- Optimization of mining complexes with joint supply (raw materials) and demand (markets)
- Linking long- and short-term planning in mining complexes

COMPUTER WORKSHOPS

- Uncertainty modelling and risk quantification in existing designs - choosing a robust design
- Step-by-step simultaneous stochastic optimization of a copper-gold mining complex
- Assessment of the strategic plan for the copper-gold mining complex

WHO SHOULD ATTEND

This course is designed for mining engineers, mine planners, mine geologists, project managers, resource analysts, involved in feasibility studies, development and operations, interested in new technologies for risk management and optimal decision support.

https://www.cim.org/professional-development/mcgill-professional-development-seminars/