PACRIM
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An introduction to machine learning and data analytics

Date: Saturday 6 April – one-day; 8:00 am – 5:00 pm

Presenters:

Michael Gazley, RSC Mining and Mineral Exploration

Michael is the Principal Geochemist at RSC Mining and Mineral Exploration based in Wellington, New Zealand. He was previously a Senior Research Scientist at CSIRO Mineral Resources, based at the Australian Resources Research Centre, Kensington, Perth, Western Australia. Prior to joining CSIRO in 2013, Michael spent over five years working for Barrick Australia Pacific Ltd as an underground geologist based at Plutonic Gold Mine, and he completed his PhD on that deposit. During this time, he worked across a number of Barrick sites developing pXRF best practice and utilising pXRF to gain geological insights into mineral deposits.

Michael has conducted research projects on a wide range of deposit styles and types, and more recently he has examined ways to use machine learning and data analytics to enhance interpretation of geochemical datasets from mine and exploration settings. This has included datasets from projects in New Zealand, Eritrea, Philippines, Argentina, Chile, Australia and Mozambique.

Shawn Hood, University of Tasmania

Shawn is an economic geologist currently completing PhD studies at the University of Tasmania, Australia, while consulting on minerals projects in Australia, Namibia and Eritrea. He previously spent three years in exploration and two years as an underground project geologist with Gold Fields Australasia at St Ives, Western Australia. Other prior experience includes precious and base metal exploration in Mongolia and Canada.

Shawn applies machine learning techniques to understand ore deposits by integrating disparate datasets and enhancing mineral exploration work programmes. For example, combining geochemical data with remote sensing to inform exploration targeting. He has a focus on understanding how this technology can deliver objective and repeatable results in mineral exploration settings, using geologists who can guide machine learning models and ground truth their results. He is a graduate of Carleton University in Ottawa (BSc Hons.) and the University of British Columbia's Mineral Deposits Research Unit (MSc).

Short course description:

Mineral exploration and mineral deposits are often data-rich environments. This is especially true as geochemical and geophysical data sets increase in precision, resolution, and volume. Data-driven geoscience can be an effective method of resource discovery and mineral deposit modelling. This short course is intended to introduce geologists to the growing field of machine learning / data analytics, as applied towards exploration and mining geology. It is aimed at senior students of geoscience, exploration managers, geochemists, and exploration geologists.

The morning sessions will acquaint attendees with essential topics such as the 'closure issue', applying ratios and log-ratios to compositional data, multivariate methods including principal component analysis, clustering and classification, and uncertainty measures. The afternoon session will provide a practical exercise(s) related to data analytics in geochemistry and will consider real-life datasets with workflows implemented using freely-available visualisation and data analysis software.

The purpose of this course is to provide geologists with the understanding to ask what kind of data analytics is best-suited to their problem, and to demystify this growing field by providing the tools for them to conduct their own simple data analytics.

Included:

- Lunch, morning and afternoon teas
- Printed material

Minimum number of participants: 10

Cost: NZ $250 Member

          NZ $300 Non-Member

          NZ $50 Student

Further information: Email Michael Gazley at m.gazley@rscmme.com