An introduction to machine learning and multivariate data analysis

One-day short course, 1 April 2022

SHORT COURSE DESCRIPTION

Key concepts to be discussed at the workshop will include that mineral exploration and mineral deposits are often data-rich environments. Data-driven geoscience can be an effective method of resource discovery and mineral deposit modelling. This short course will introduce geologists to the growing field of machine learning / data analytics for exploration and mining geology. 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.

SHORT COURSE SCHEDULE

The early 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 later session will provide a practical exercise(s) related to data analytics in geochemistry and will consider real-life datasets with workflows. The times of these components will be notified once we have evaluated the best fit for the time zones of participants registered by 15 February.

PRESENTERS

From left to right: Michael Gazley (RSCMME), Shawn Hood (GoldSpot) and Matt Cracknell (CODES University of Tasmania)

Michael Gazley

Michael is the Principal Geochemist and General Manager Geoscience at RSCMME. He has worked globally on many different mineral systems including orogenic Au, epithermal Au, placer Au, shear-hosted Cu, IOCG, Cu-Au porphyry, Pb-Zn-Ag deposits, Li and REE pegmatites, and heavy mineral sands. He is the author of more than 35 peer-reviewed journal papers with a focus on applied geochemistry, metamorphism, and economic geology.

He was a Senior Research Scientist at CSIRO Mineral Resources, based in Perth, Western Australia, for almost five years. Prior to which he spent five years working for Barrick Australia Pacific Ltd as an underground geologist based at Plutonic Gold Mine, completing his PhD on that deposit.

Michael has expertise in collecting, integrating, and interpreting diverse chemical and mineralogical datasets using multivariate techniques in exploration and mining settings. He is also an expert in pXRF data collection and interpretation, and has written a best-practice paper on the subject. Michael uses and develops cutting-edge data handling and machine learning techniques to maximise value from geochemical, mineralogical, and remote-sensing datasets.

Shawn Hood

Shawn is Chief Technology Officer at GoldSpot Discoveries Corp where he oversees the company's technology strategies, the application of Artificial Intelligence to mineral exploration projects, and ongoing research and development programmes. He is University Associate at CODES – the Centre for Ore Deposit and Earth Sciences (University of Tasmania, Australia) and has a broad base of previous exploration and mine geologist roles ranging across open pit, underground, brownfields and greenfields projects in Canada, Australia, and Mongolia.

Matt Cracknell

Matt is a Lecturer in Geodata Analytics at the Centre for Ore Deposit and Earth Sciences (CODES) University of Tasmania. His research focuses on the use of data mining and pattern recognition techniques for integrating and analysing geoscience data. Matt seeks to bridge the gap between geoscience domain experts and computational data analytics methods. In his spare time, he teaches undergraduate and postgraduate courses on geodata analytics and supervises numerous postgraduate students.

FEES

$140 for members, $180 for non-members, $70 for student or retired members and $90 for student or retired non-members. Register at https://confer.eventsair.com/sga2022/registration

FURTHER INFORMATION

Email Michael Gazley at m.gazley@rscmme.com