



CSPG Short Education Courses

Data Science for Geoscientists

Date: Monday, June 27, 2022 | from 8:30am – 4:00pm (MST)

Location: 540 – 5th Avenue SW, Calgary. Aquitaine Tower

Instructor: Ryan Mardani

Course Fee:

CSPG Members: \$725.00 + GST

CSPG Non-Members: \$925 + GST

(Lunch and morning/afternoon snacks will be provided)

Registration closes on June 20th at 9:00am

Abstract:

This course will be broken up into the following four parts:

1. Introduction to Python
 - Variables and Data Types
 - Operations
 - Python Data Collections and Structures
 - Loops and Functions
 - Generate Synthetic Seismogram
2. Data preparation with Pandas
 - Data cleaning
 - Null elaboration
 - Merging datasets
3. Data Analysis with Pandas
 - Data statistics and correlation
 - Data subsetting, filtering, aggregation, and pivoting
 - Data visualization, plot histograms and KDE, box plots, ...
4. Machine learning with Scikit-Learn
 - Well log and lithology Data preparation for ML algorithms
 - Feature engineering
 - Select and train model with cross validation
 - Fine tune model with hyperparameter adjustments
 - Evaluation metrics and model performance analysis

In this workshop, examples will be mainly from geoscience like synthetic seismogram, rock facies and well logs.



Objectives:

Python is a popular programming language, easy to learn, has a readable code structure, and comes with a lot of powerful libraries. You will use Python to elaborate datasets with oil and gas origins. Data analysis and visualization will be implemented with Pandas library.

This course is designed for geoscientists and subsurface engineers to develop machine learning algorithms to learn from data then estimate your favorable variables like lithology or missing logs.

By the end of the course, learners will be able to:

- Implement and analyze learning algorithms for classification and regression
- Implement practical steps: data preprocessing, learning, regularization, and model selection
- Compare and contrast different paradigms for learning
- Design experiments to evaluate and compare different machine learning techniques on geoscientific problems like lithofacies prediction from well logs.

Who Should Attend?

This is an interdisciplinary course introduces data science application on geoscientific problems.

This course is ideal for professionals and researchers of oil and gas domain with minimum background knowledge of geoscience. We encourage geologists, geophysicists, petrophysicists, reservoir engineers, and managers to attend the course to experience digital transformation on geoscience domain data.

You don't need to have solid knowledge of Python programming. Codes, scripts and datasets required for the course will be provided.

Biography:

Ryan A. Mardani is a Geo Data Scientist who has over 18 years of industry experience as a geoscience interpreter and software trainer and developer. He has worked on conventional and unconventional resources in the Middle East, Africa, and Canada. In addition to conventional integrated reservoir studies, he helped the oil and gas, energy, and mining companies to apply machine learning and data science techniques to put their valuable data to more efficient use.

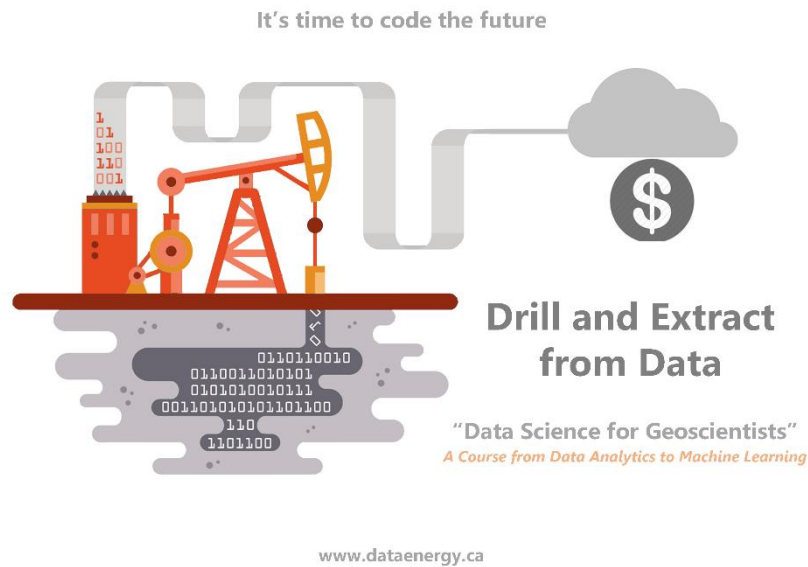
Ryan is currently the Senior Consultant for Data Energy where he automates geoscience tasks, analyze relational and non-relational datasets and extract business values by combining conventional approaches with machine learning algorithms. He



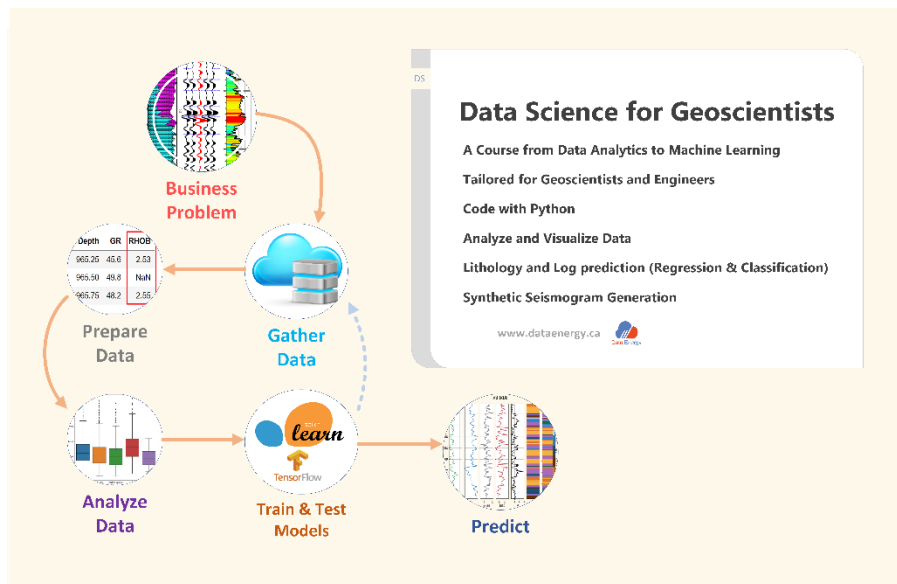
builds intelligent machines to learn from GeoData to discover patterns and trends embedded in vast volumes of data to improve data driven decisions.

He is also adjunct instructor, teaching database and data analytics courses in Southern Alberta Institute of Technology (SAIT) for corporate division.

Related Images:



Data Science is to drill deep into datasets. Data acquired from oil and gas domain can be drilled for more values.



Data Science has standard workflow that we will apply to geoscience data to build intelligent machines to discover trends and predict our targets.