Petrogenium. Academy

Upstream (Geophysics)
Gravity & Magnetic Data Acquisition, Processing, and Interpretation

Consultant / Trainer

Jaap Mondt

The **Petrogenium (in collaboration with EPTS) Gravity & Magnetic Data Acquisition, Processing, and Interpretation** participants in geophysical studies benefit from a comprehensive understanding of the subsurface by using various types of geophysical data. Seismic data is the primary method for imaging subsurface structures, helping to identify hydrocarbon reservoirs, map faults, and optimize well placement, while non-seismic data like gravity, magnetics, electrical, and electromagnetic measurements provide complementary information, especially in areas where seismic data is limited or for shallow subsurface applications. Integrating both seismic and non-seismic data reduces uncertainty in subsurface models, supports early reconnaissance and prospect mapping, and enhances decision-making for drilling and reservoir management.

Participants

This **Petrogenium.** course aims at all those interested in understanding the impact Machine Learning will have on the Geosciences and then specifically the impact on geophysical processing and interpretation. Hence, geologists, geophysicists and petroleum and reservoir engineers, involved in exploration and development of hydrocarbon fields, but also those working in shallow-surface geophysics.

Learning Objectives

Participants will gain understanding how gravity and magnetic fields can be used to investigate subsurface structures, and to appreciate both their limitations and recent advances in these methods. Specifically, learners should be able to describe the Earth's gravity and magnetic fields, explain how anomalies relate to density and magnetization contrasts, and recognize the non-uniqueness issues in interpreting potential-field data. Learners should also understand why gravity gradiometry and new magnetic interpretation techniques are promising developments for improving resolution and reducing ambiguity.

Programme

Day 1

1. Biography, Program, Moodle, 52 Things, Teams
2. Geophysical Methods, Gravity JDF I
3. Exercise: Depth Sphere
4. Exercise: Depth Anticline
5. Videos: Gravity
6. Exercise: Gravity Sphere
7. Gravity JDF II
8. Exercise: Grav2dc 4D, Swing
9. Quiz 1
10. Team a: Preparation Summary of day 1

Why select Petrogenium.?

The above support will be provided by principal consultants with 30+ years world-class experience in the technology and hands-on know-how from operation of refinery units.

Because Experience Matters

Contact Petrogenium.:

Email: training@petrogenium.com
Website:https://www.petrogenium.com/training/

Programme

Day 2

1. Team a: Summary of day 1
2. Gravity JDF III
3. Exercise: Depth Estimation
4. Exercise Olympic, Tapei Tower
5. Videos: Tokyo Skytree, Gravity Train
6. Exercise: Grav2dc Inv
7. Introduction Machine Learning
8. Exercise:Gravity Resolution
9. Quiz 2
10. Team b: Preparation Summary of day 2

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Day 3

1. Team b: Summary of day 2
2. Magnetics
3. Exercise: Magnetics
4. Magnetics JDF I
5. Exercise: Mag2dc Incl, Mag Anomaly
6. 12:00-13:00 Magnetics JDF III
7. 14:00-15:00 Videos: The North
8. 15:00-15:30 Grav-Mag Sign
9. 15:45-16:15 Exercise: Resolution Basement
10. 16:15-17:00 Seis-Grav-Mag-Grad
11. 17:00-17:30 Quiz 3
12. 17:00-17:30 Team c: Preparation Summary of day 3

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Programme

Day 4

1. Teamc: Summary of day 3
2. Magnetics JDF IV
3. Exercise: Mag2dc Inv
4. Local Magnetics
5. Exercise: Magnetic Latitudes
6. Videos: Magnetic Dangers, PGK Machine learning
7. Exercise: Grav-Mag
8. ML Keras, TensorFlow
9. Exercise: Geomodel Inv
10. Supervised, Unsupervised and Semi-Supervised learning
11. Quiz 4

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