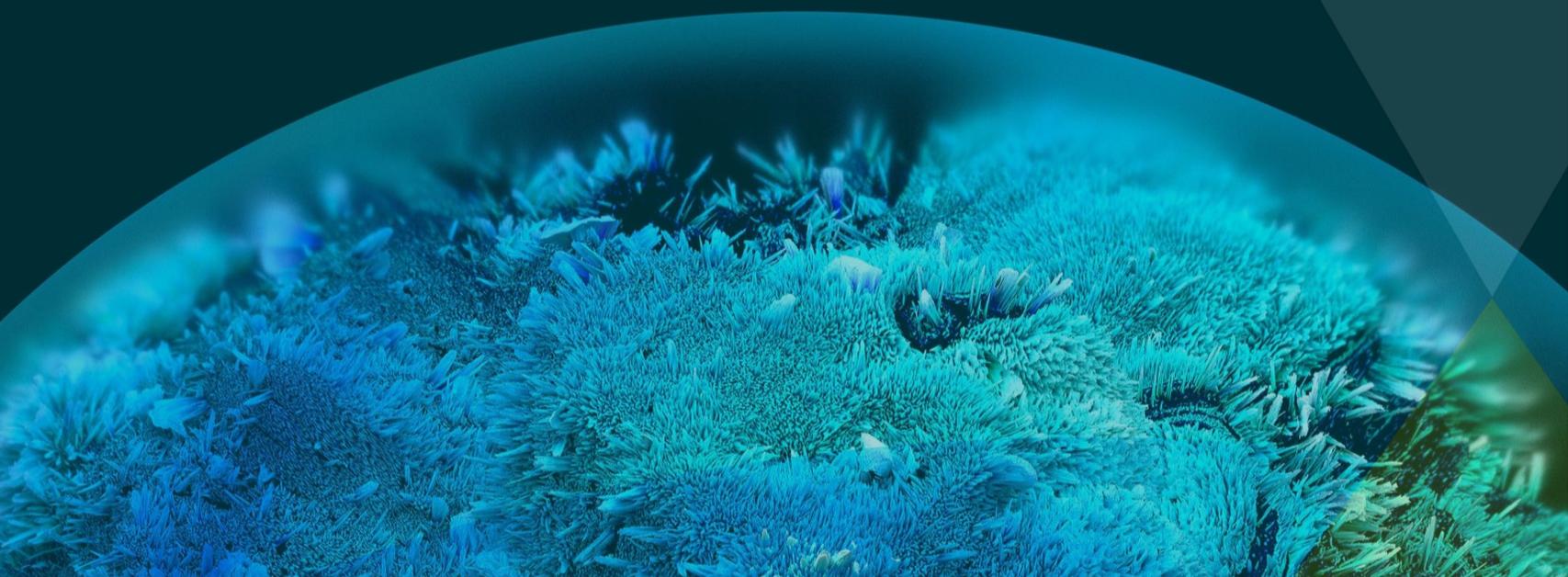




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Data Management

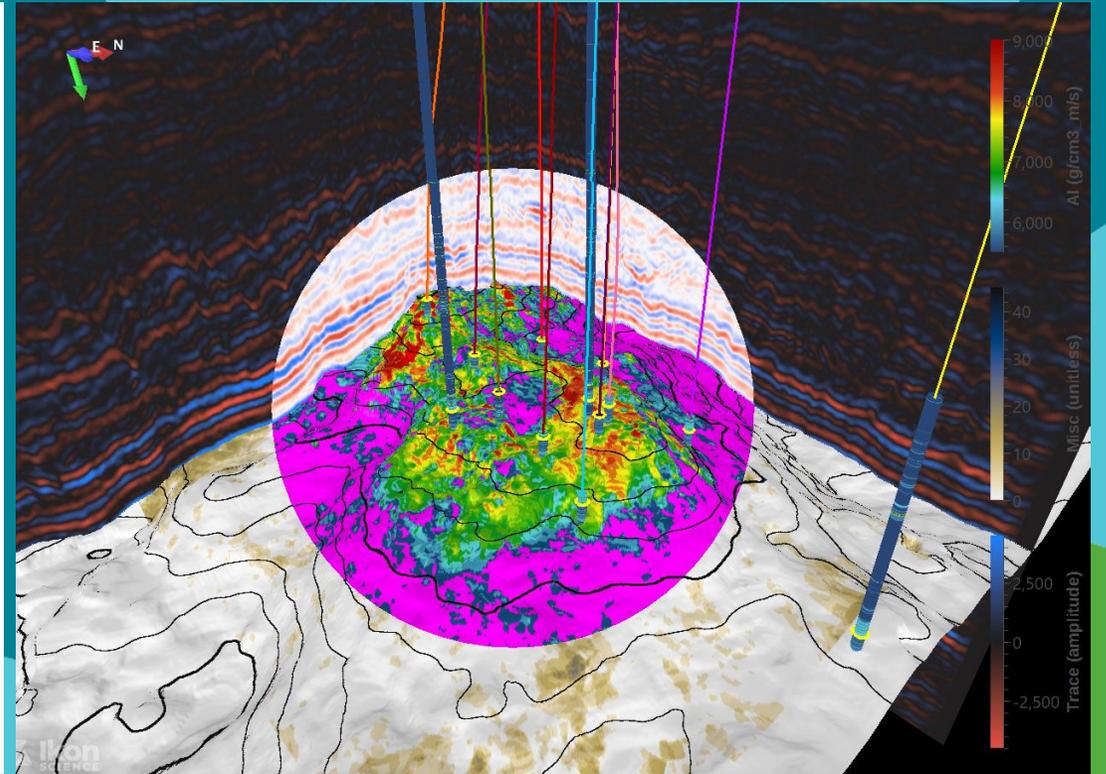
Transforming Your Digital Landscape

Geoscience-led solutions for integrated workflows and subsurface knowledge leveraging AI

Seismic SPE 2024

Presented by Rosalena Filograsso

ikon
SCIENCE



Agenda

Challenges in subsurface data workflows

Machine Learning & Artificial Intelligence

ML Integrated solutions

Generative AI solutions

What's next?

Challenges in subsurface data workflows

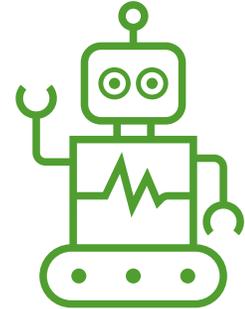
At project startup, data are loaded, and assessed for availability and quality

Plots and documentation often produced, which can take significant time

How can we address the challenge and become more **efficient**?

Artificial Intelligence & Machine Learning

Artificial Intelligence is any computer software that mimics the ways that humans think in order to perform complex tasks, such as analysing, reasoning, and learning



Machine Learning, meanwhile, is a subset of AI that uses algorithms trained on data to produce models that can perform such complex tasks.

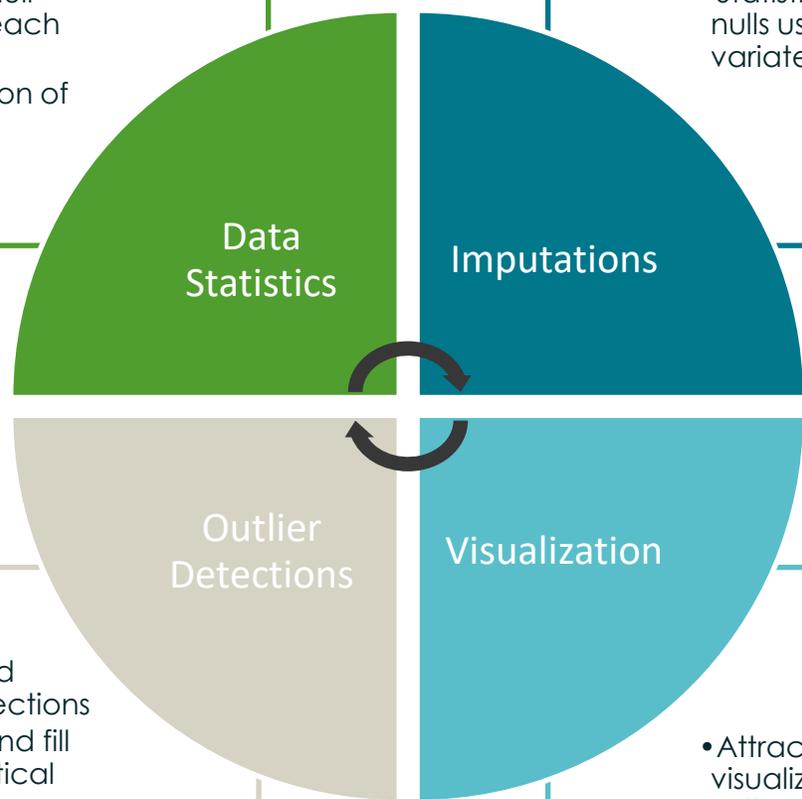
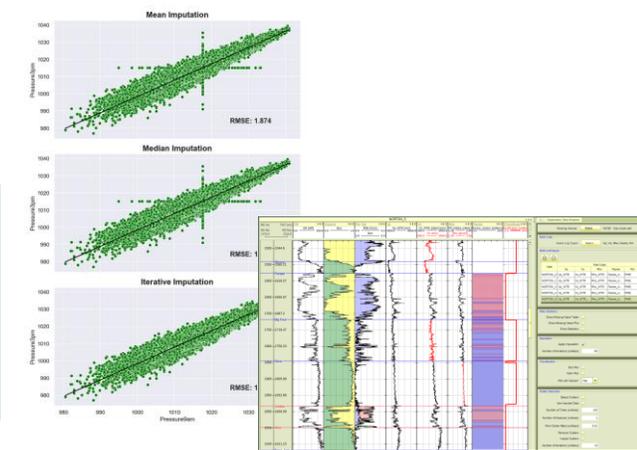
How can we integrate them in our subsurface characterisation workflows?

Exploratory Data Analysis



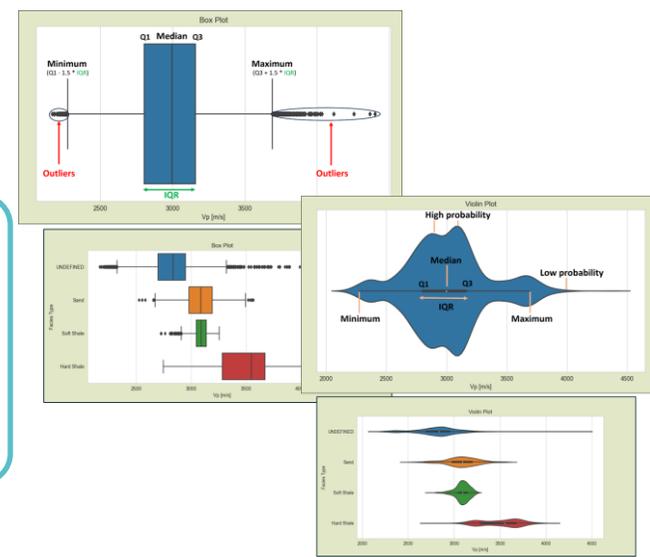
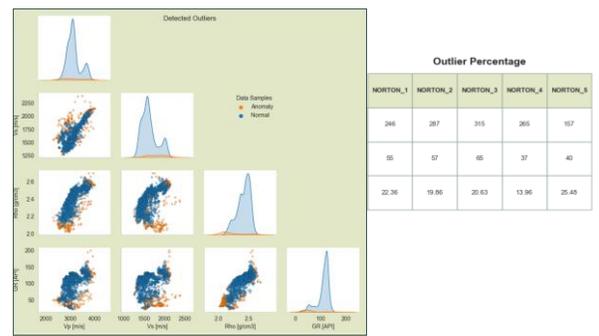
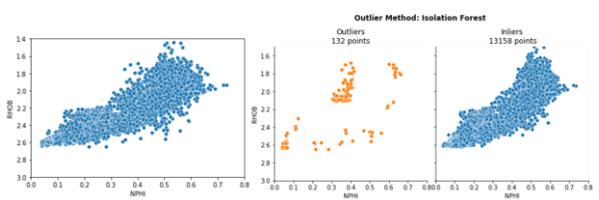
- Statistics null values in each well
- Visualization of nulls

- Statistical filling of nulls using multi-variate analysis



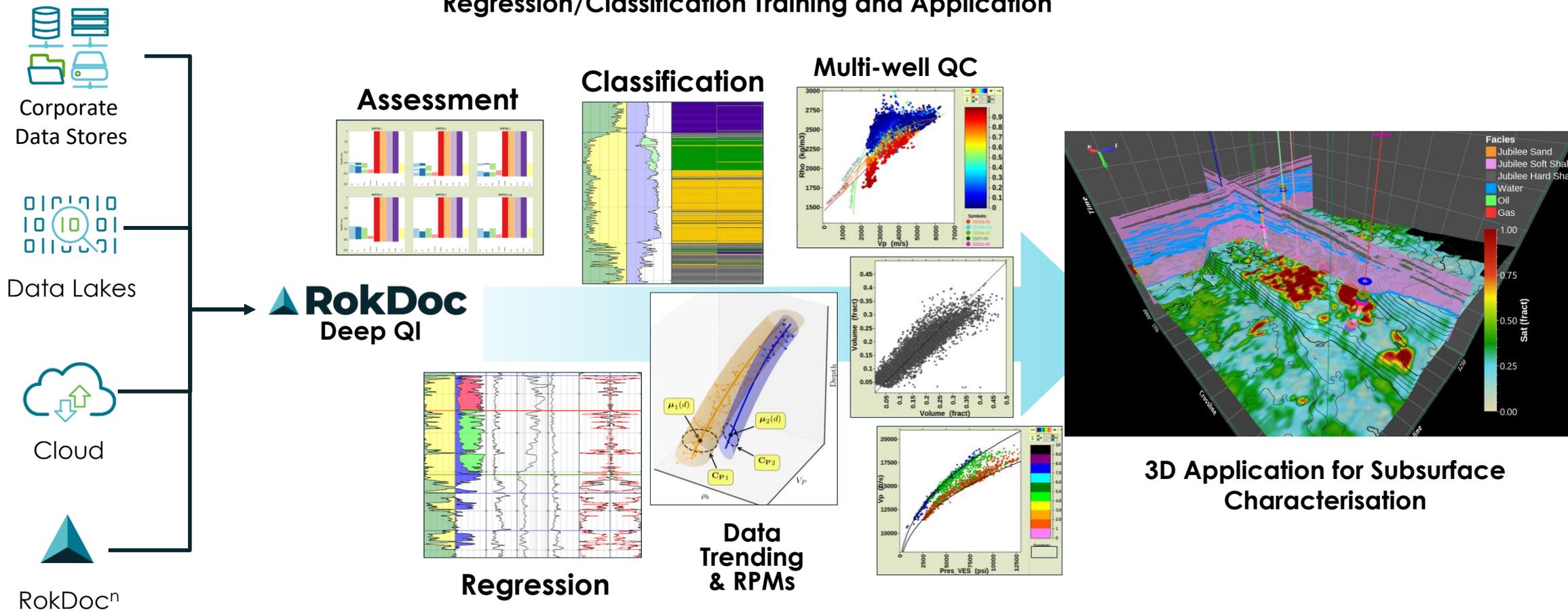
- Automated outlier detections
- Remove and fill using statistical ways

- Attractive visualizations using Python

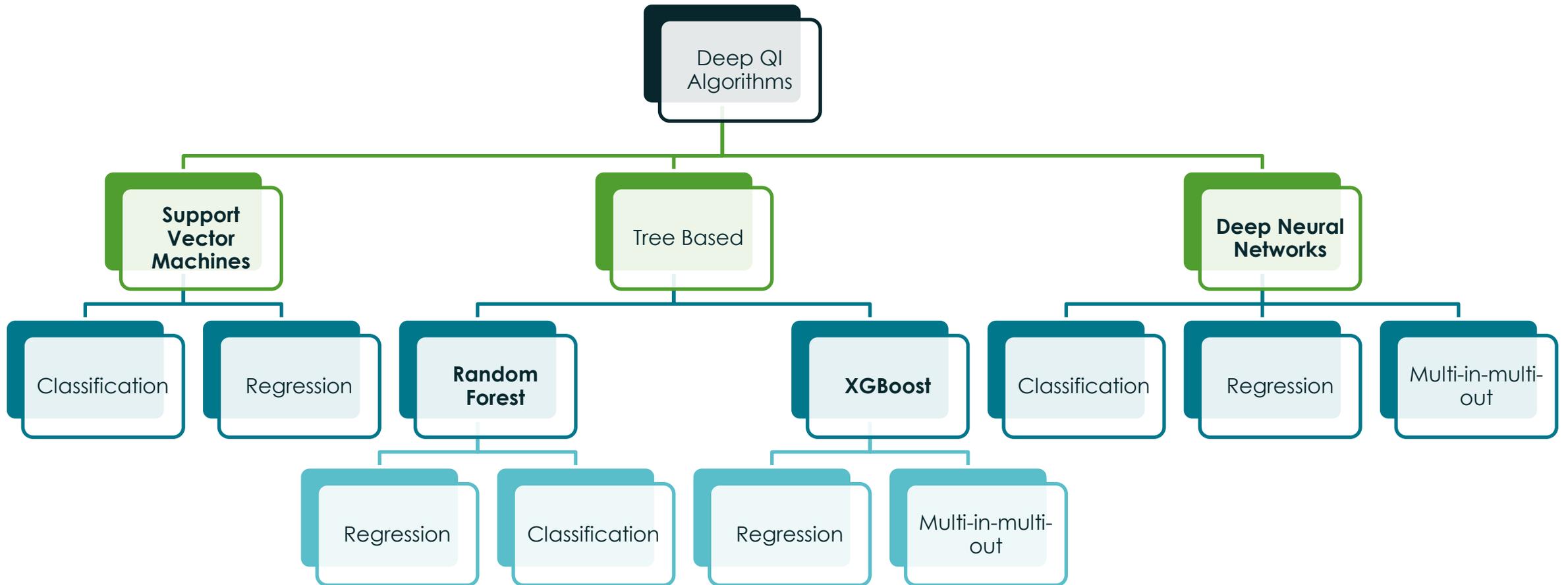


RokDoc's Deep QI fully integrated solution

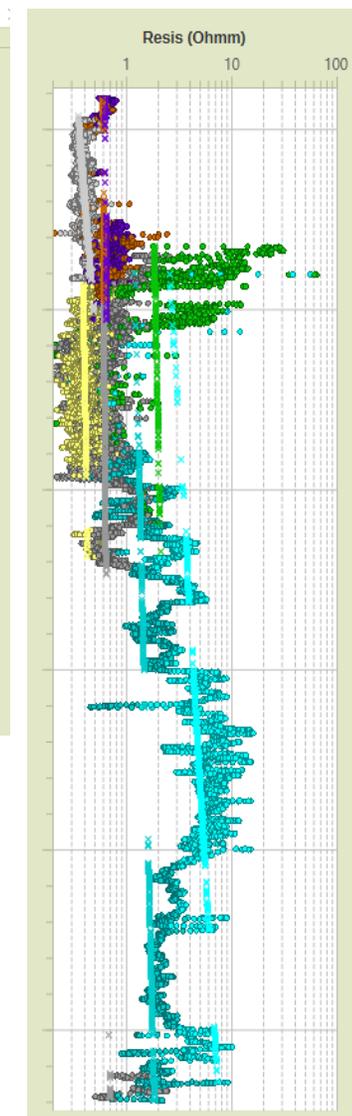
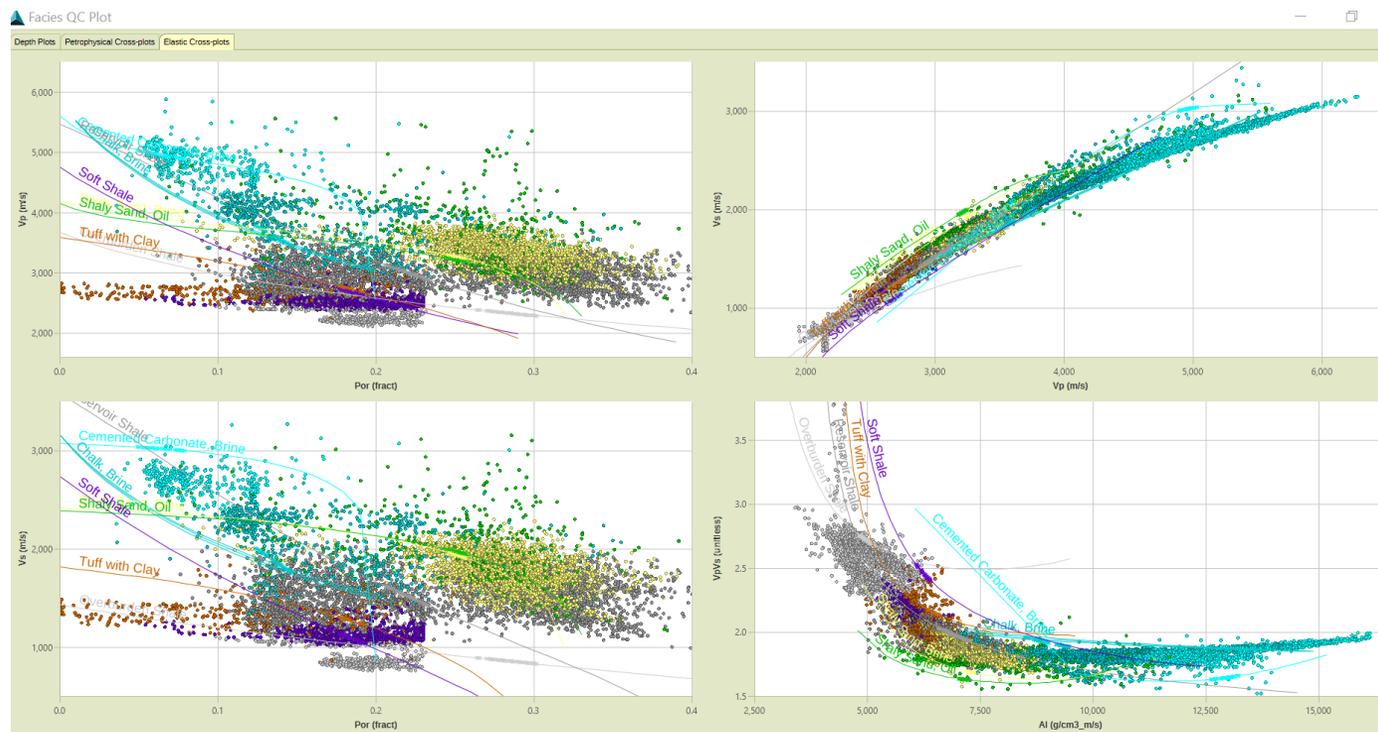
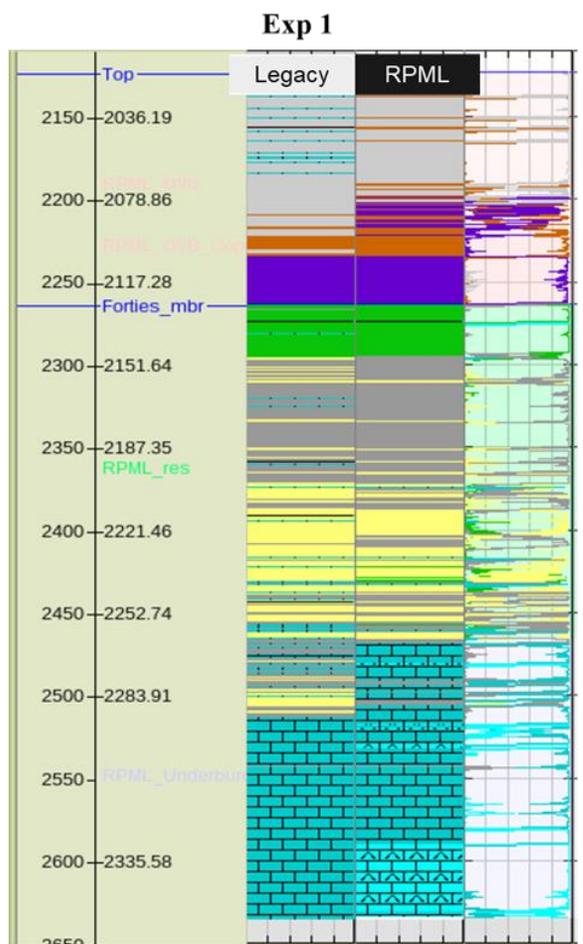
Regression/Classification Training and Application



Supervised Learning



Rock Physics Machine Learning (RPML)



Speed

Significantly quicker than manual interpretation (hours rather than weeks)



Control

A library of RPMs is pre-defined, as is an understanding of lithologies and the appropriateness of each RPM to each lithology.



Consistency

Once the framework is setup and verified, it can be applied to subsequent workflows consistently

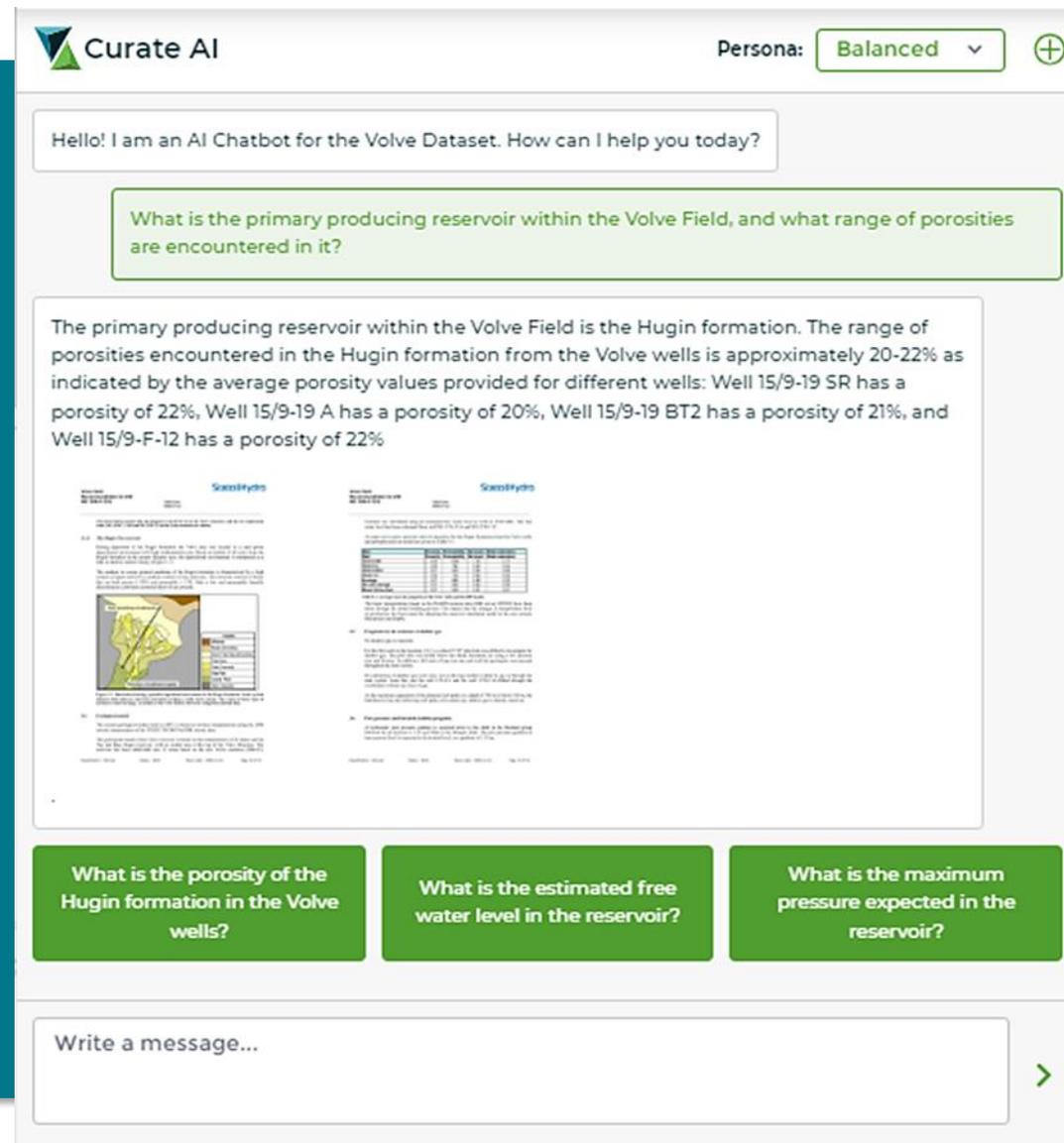
Generative AI: Curate AI Chat

Problem:

- 80% of well data is in unstructured format, making it inaccessible to traditional software and workflows.
- This dark data has limited operational value

Solution:

- Curate AI Chat – powered by generative AI – allows users to communicate and access these documents.
- Written queries return referenced and insightful answers – fuelling knowledge in your organization
- Sourced documents are reference and linked via a thumbnail – for contextual understanding



Curate AI Persona: **Balanced**

Hello! I am an AI Chatbot for the Volve Dataset. How can I help you today?

What is the primary producing reservoir within the Volve Field, and what range of porosities are encountered in it?

The primary producing reservoir within the Volve Field is the Hugin formation. The range of porosities encountered in the Hugin formation from the Volve wells is approximately 20-22% as indicated by the average porosity values provided for different wells: Well 15/9-19 SR has a porosity of 22%, Well 15/9-19 A has a porosity of 20%, Well 15/9-19 BT2 has a porosity of 21%, and Well 15/9-F-12 has a porosity of 22%

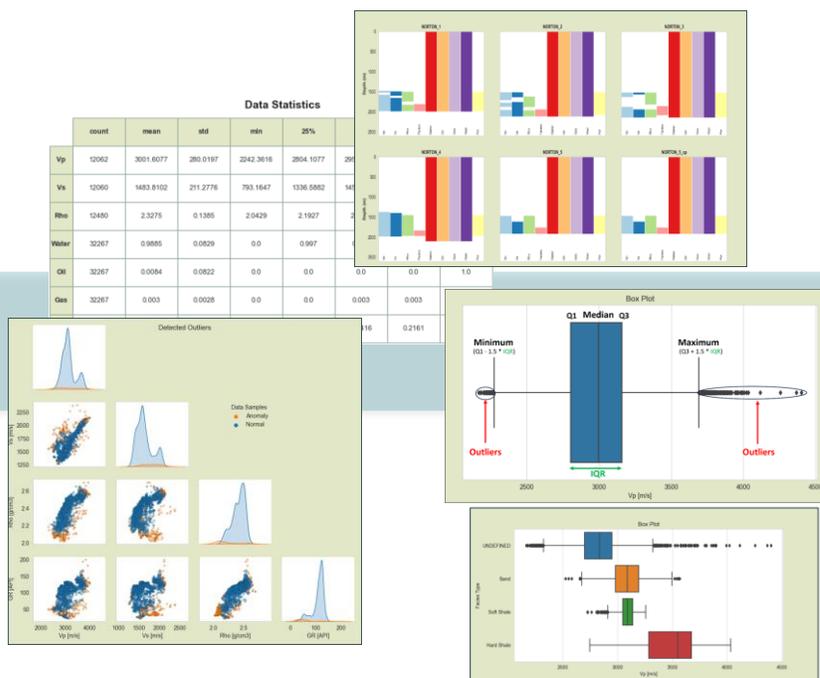
What is the porosity of the Hugin formation in the Volve wells?

What is the estimated free water level in the reservoir?

What is the maximum pressure expected in the reservoir?

Write a message...

Machine Learning and GenAI: what's next



Machine Learning Output

Curate AI Persona: **Balanced**

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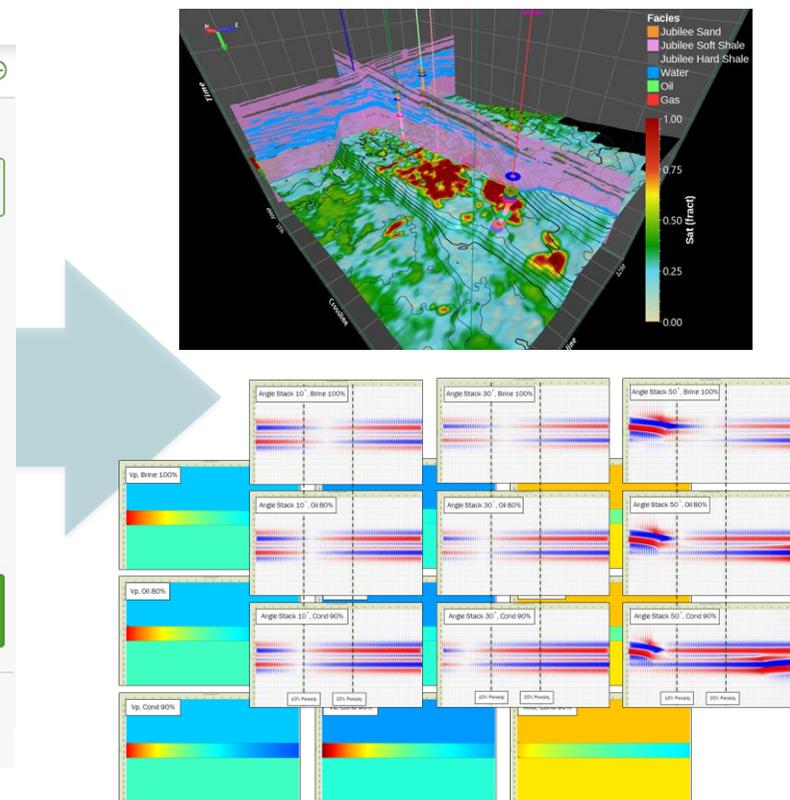
What is the porosity of the Hugin formation in the Volve wells?

What is the estimated free water level in the reservoir?

What is the maximum pressure expected in the reservoir?

Write a message...

Artificial Intelligence Chat



THANK YOU

Any questions?

Email info@ikonscience.com
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