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By:

APGCE ASIA PETROLEUM GEOSCIENCE CONFERENCE & EXHIBITION
'Asia's Premier Geoscience Event'

PETRONAS

2024 GEOHACKATHON

16 – 18 November 2024

Common Ground Bukit Bintang, Kuala Lumpur

FAULT PREDICTION

Challenge 1

PyTTEP

Dzul – Nadrah – Liana – Hana - Nilam

Sponsored by:

ConocoPhillips · enQuest · ERCE The expertise tomorrow needs · ExxonMobil · JX · VIRIDIEN

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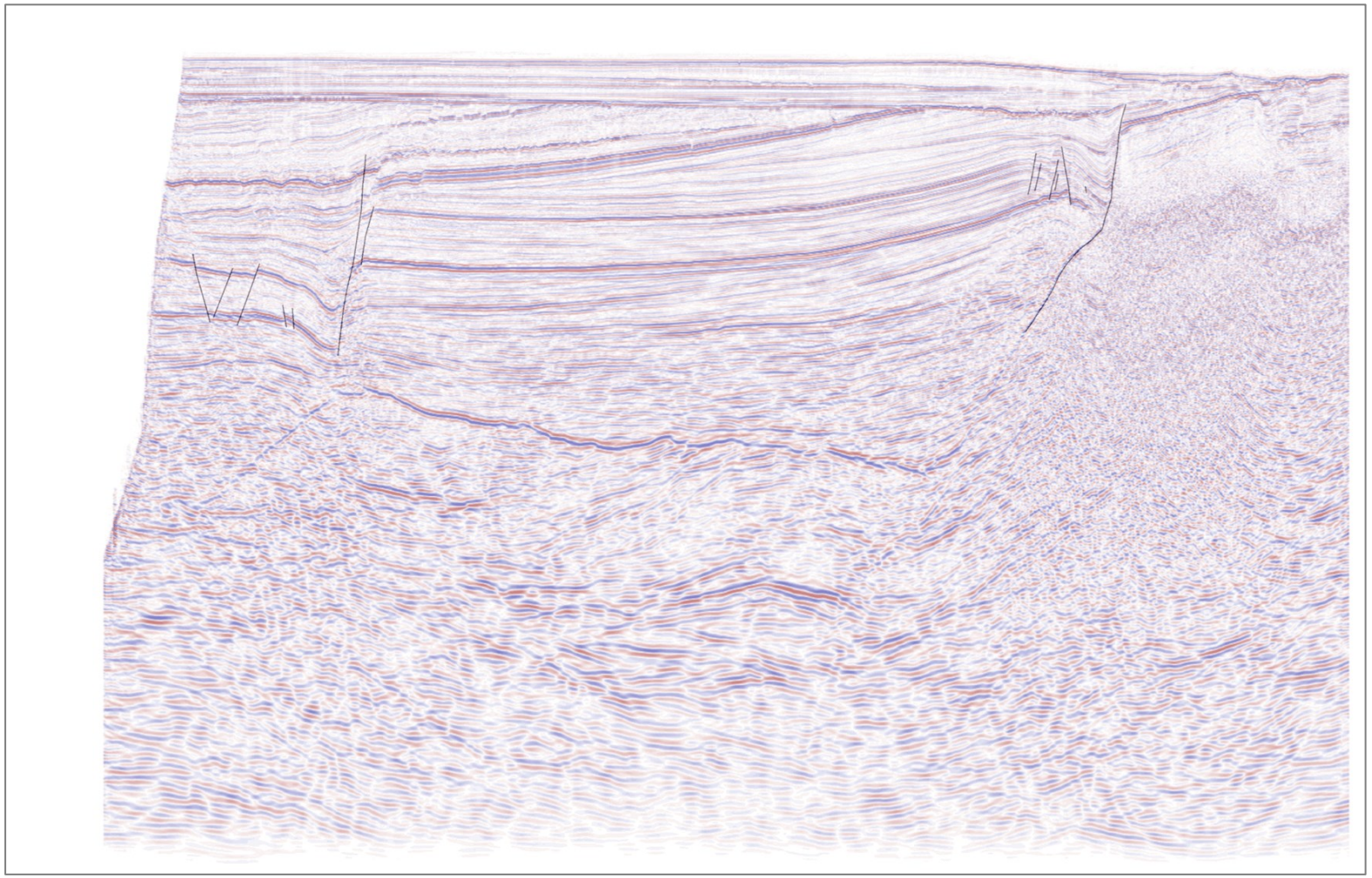
Fault Interpretation

2024 GEOHACKATHON

Challenge Masks



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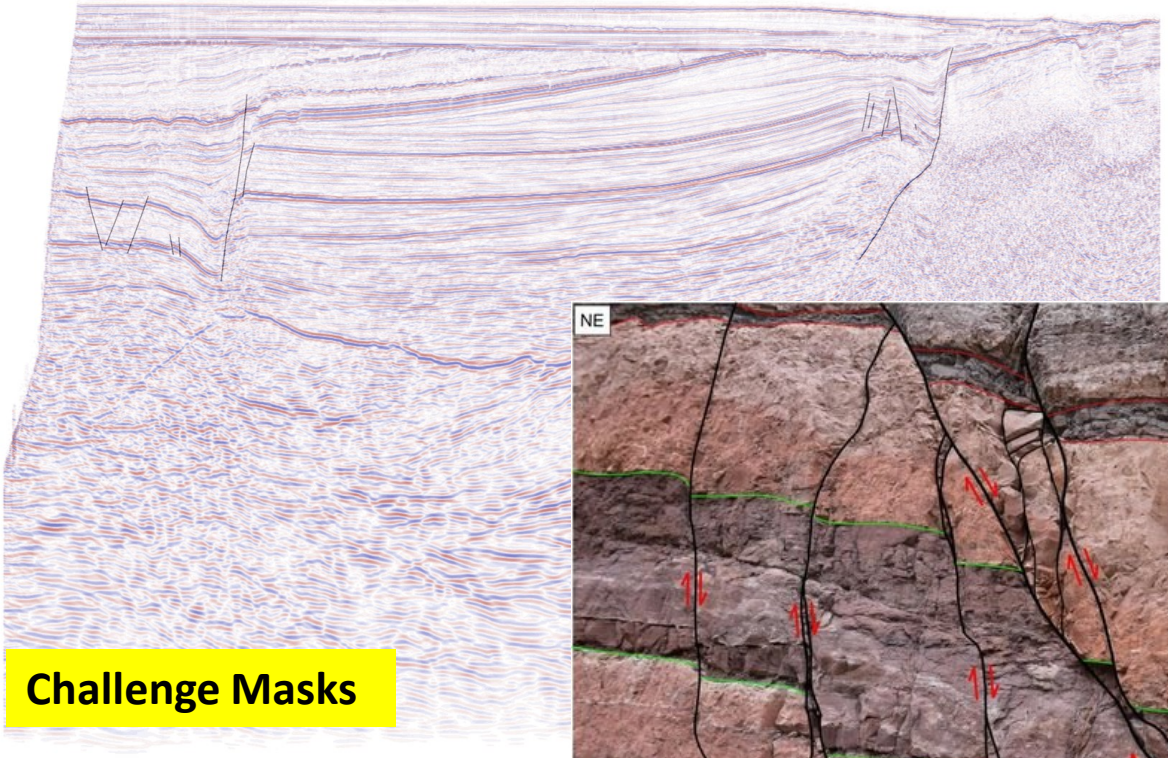
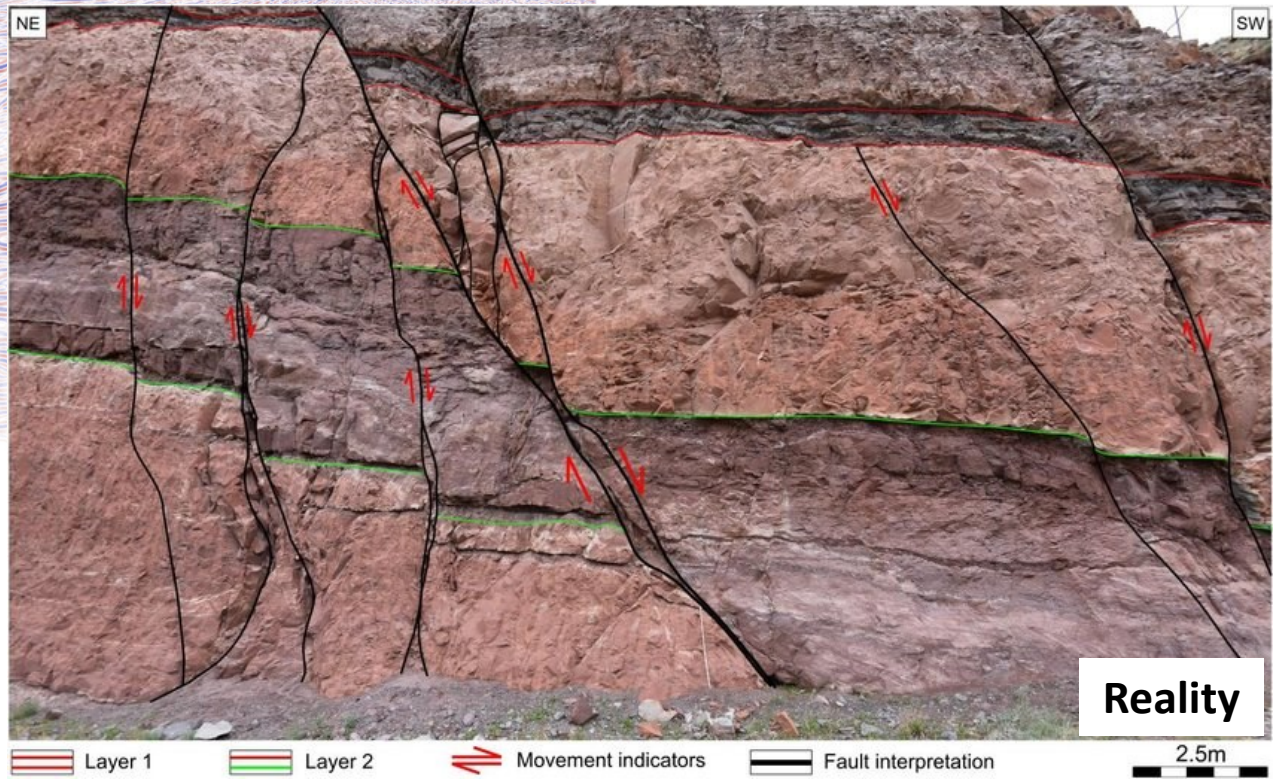
Machine Automation on Fault Interpretation



Challenge Masks

Johannesen, 2017



Reality

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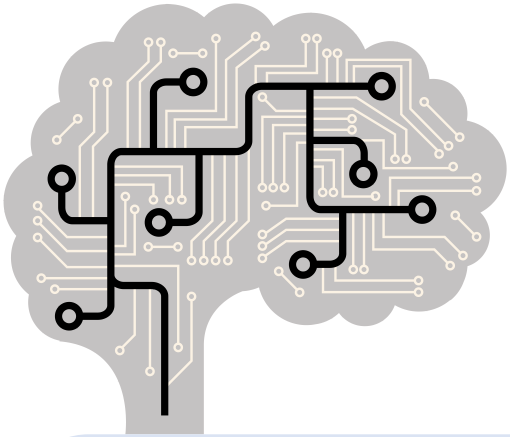
Methodology



Deep Learning
Image pattern recognition

- *DeepLab V3*
- *Simple CNN*

Input unit

Data Pre-process
Model Selection

Normalization & Binary Color Scaling

Test data &Training data

01 U-Net Architecture

02 Trained CNN

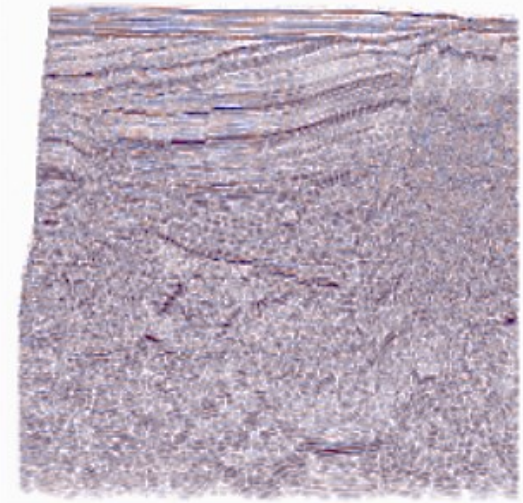
Prediction data

Output unit

Training Model

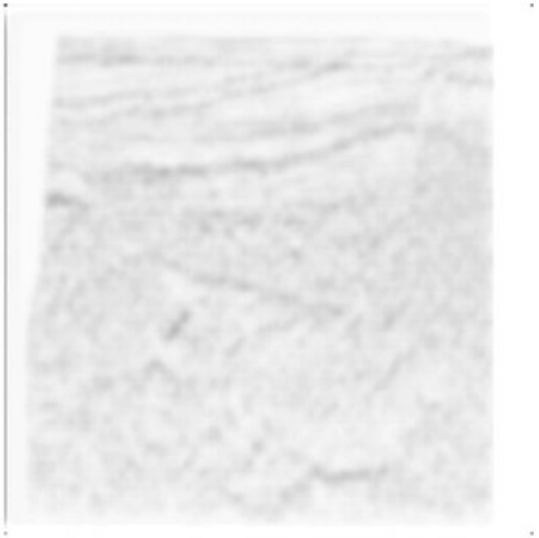
Seismic Image Range: 0 – 1
Fault Mask Range values: 0 – 1 (0 = black, fault; 1, white, background)

Seismic Image



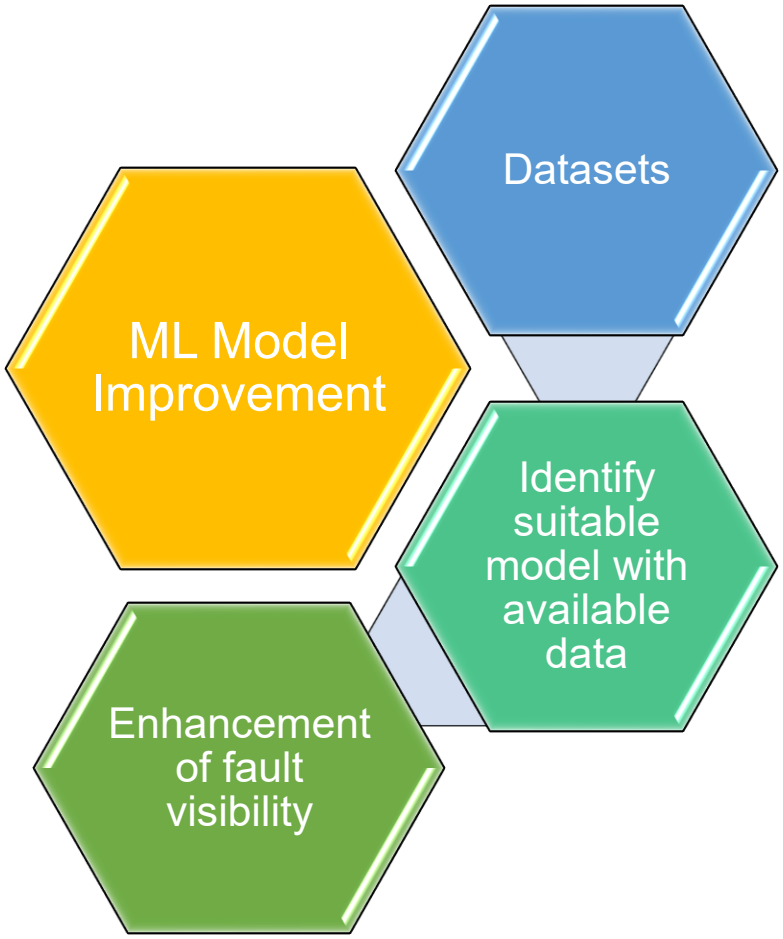
True Fault Mask

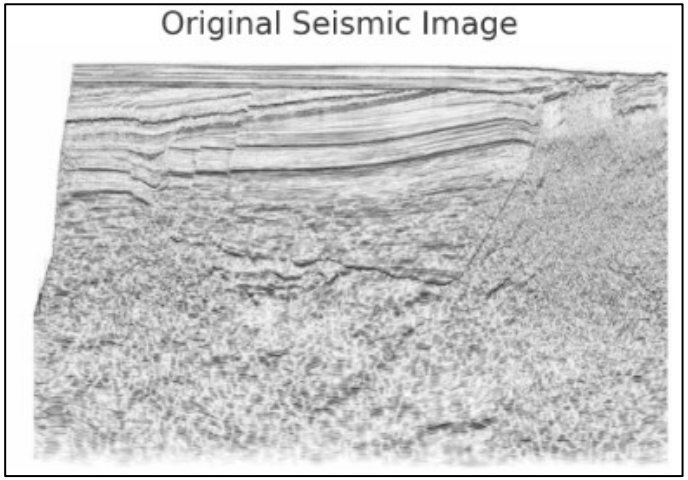
Predicted Fault Mask

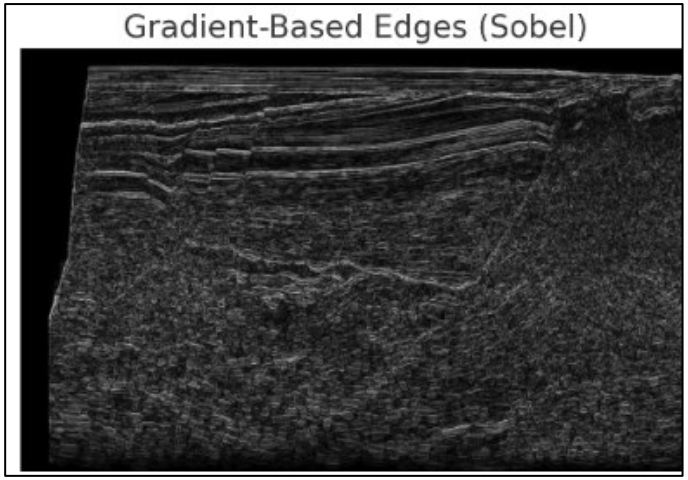


- Functioning model from selected frameworks and architecture
- Room for improvements:
  - Revisit input data framework
  - More runs to train the model better

Way Forward


Datasets
ML Model Improvement
Identify suitable model with available data
Enhancement of fault visibility


Original Seismic Image


Gradient-Based Edges (Sobel)

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Thank you!