AI Prototype Application for Oil and Gas industry

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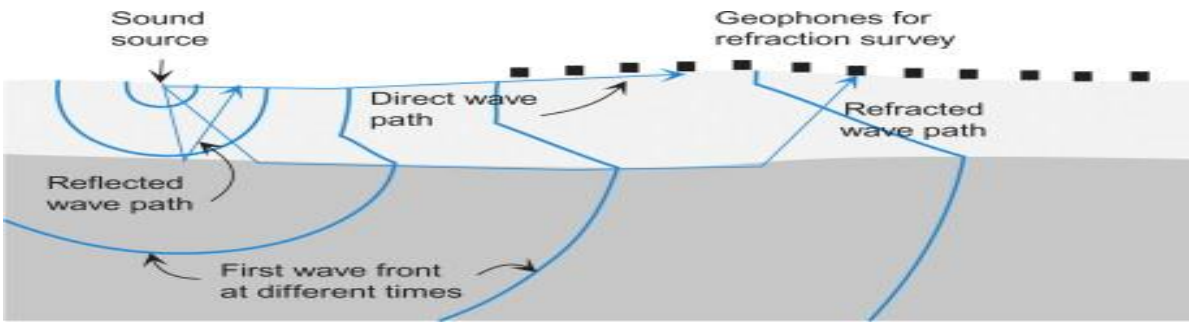
Abstract: The Petroleum industry ,also Known as the oil and gas industry include global processes like Exploration,Extraction,Refining ,Transportation and marketing
The largest volume products of the industry is fuel oil,petroleum gas etc……
Our main focus in this project is about Exploration part of the industry

There are many process to explore the oil field In a particular region like Gravity methods,Magnetic methods,Electric and Electromagnetic methods,Seismic and borehole methods
Our main work is related to seismic methods;

Problem statement:

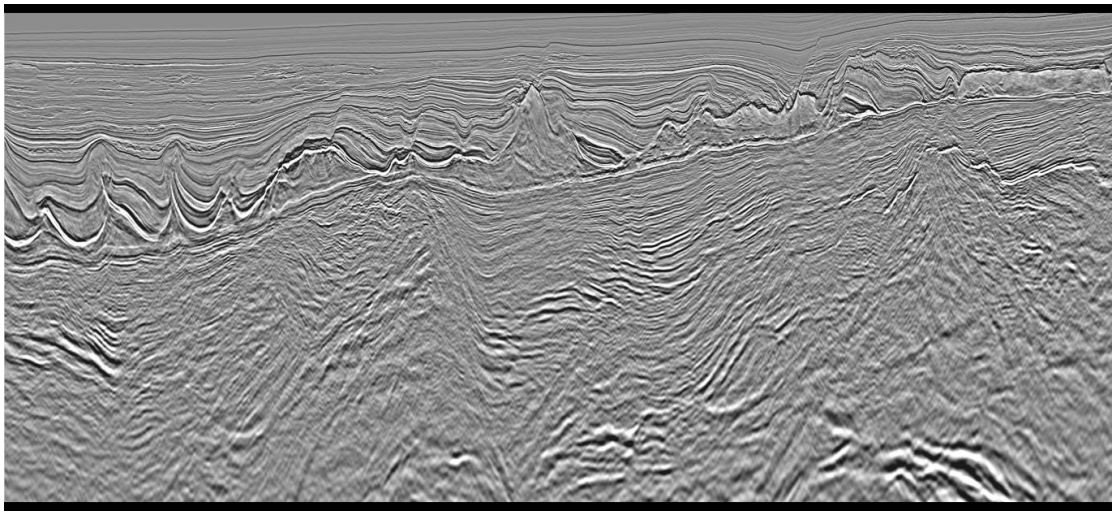
Before begin we have to know what is seismic method for Exploration:
Seismic methods are based on the study of elastic wave propagation inside the earth ,These wave are generated by explosive or impulsive sources
When these wave Reflected through various layers inside earth like oil or gas chamber we got trace through geophones,the nature of these trace depend on the reflector ,our in this project we have to make AI application which can detect the nature of the Reflector based on input trace



Steps to making this application:

This is basically based on supervised learning algorithm ,the input traced are collected as picture format in from computer processed seismic traced (reflection & refraction) after that we have to do some preprocessing to attnuated the ambient noise and other un-wanted noise ;

The final graph looks like:



Input picture

This is supervised learning algorithm thus we have to collect atleast >3000 pictures for good prediction

Step 1)for input picture we have to pass the picture through preprocessing ;here we scale the each pixel data with minmax scaling

2) after preprocessing we have to pass this input data into several convolution layers and maxpooling or avr pooling layers depend on accuracy

3) After that we have to make this raster data into vector data using flatten() function in python

4) Then we have to pass this data into hidden neural network and output activation function should be softmax function for multi class classification for fault ,or reservoir classification inside the earth

After some interpretation we can able to classify our useful information Inside earth

The whole algorithm is to be fit into some user interface to make it user friendly application

Team required to develop:

1) Geophysicist or petrophysicist who can collect & process data
2) Machine Learning engineer

Idea:

www.researchgate.com

References:

1) Applied geophysics by telford
2) Exploration Gp by M.Gadallah

User interface for the software