KINDUZ

Oil and Gas

Improve Signal to Noise Ratio to 40db for better Geophysical Sub-surface Imaging

BUSINESS CASE

Market Trends

- Geophysical Imaging is one of the most important aspects in the development of a petroleum reservoir, and to optimize resource extraction
- Exploration of petroleum reserves is increasingly focussed on deeper reservoirs below complex overburdens
- High-quality images of the reservoir are an essential tool for multidisciplinary teams who make development and production decisions

CHALLENGE

What is the challenge and how much

- Imaging is done through multiple methods such as:
  - Gravity and magnetic methods
  - Seismic reflection methods
  - Controlled-source electro-magnetic techniques
- Each method returns back **noise** along with relevant signals
- Onshore seismic data quality is poor due to the presence of strong coherent noise

Where is the challenge

- Geophysical sub-surface Imaging

When was the challenge identified

- During FY 2013

IMPACT

What is the impact

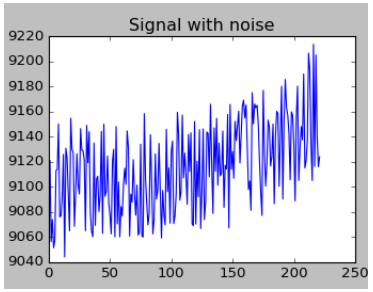
- Improper oil well imaging can lead to many business issues, including but not limited to:
  - Improper estimation of petroleum reserves
  - Inefficient development of reservoirs
  - Probably safety issues and damage to equipment
  - Low return on investments

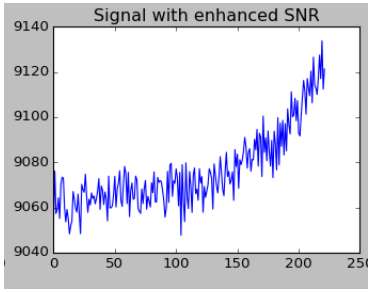
TARGET

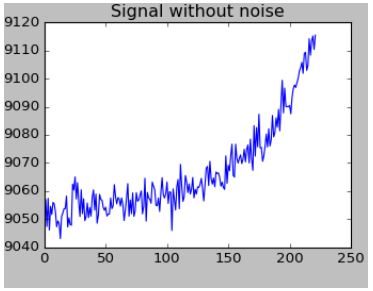
What is the Target

- Target is to improve the SNR to 40db before scientific analysis can be initiated
- The space and inter-planetary communication works at ~15db
- Evaluate and choose the best method for the SNR improvement, such as but not limited to
  - Fourier
  - Least Square Noise Estimation
  - Kalman Filters, among others

OUTCOMES







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