

SOLUTION BRIEF

SambaNova Dataflow-as-a-Service™ for Oil, Gas, and Energy

Accelerate seismic analysis, increase accuracy, and discover more resources in less time



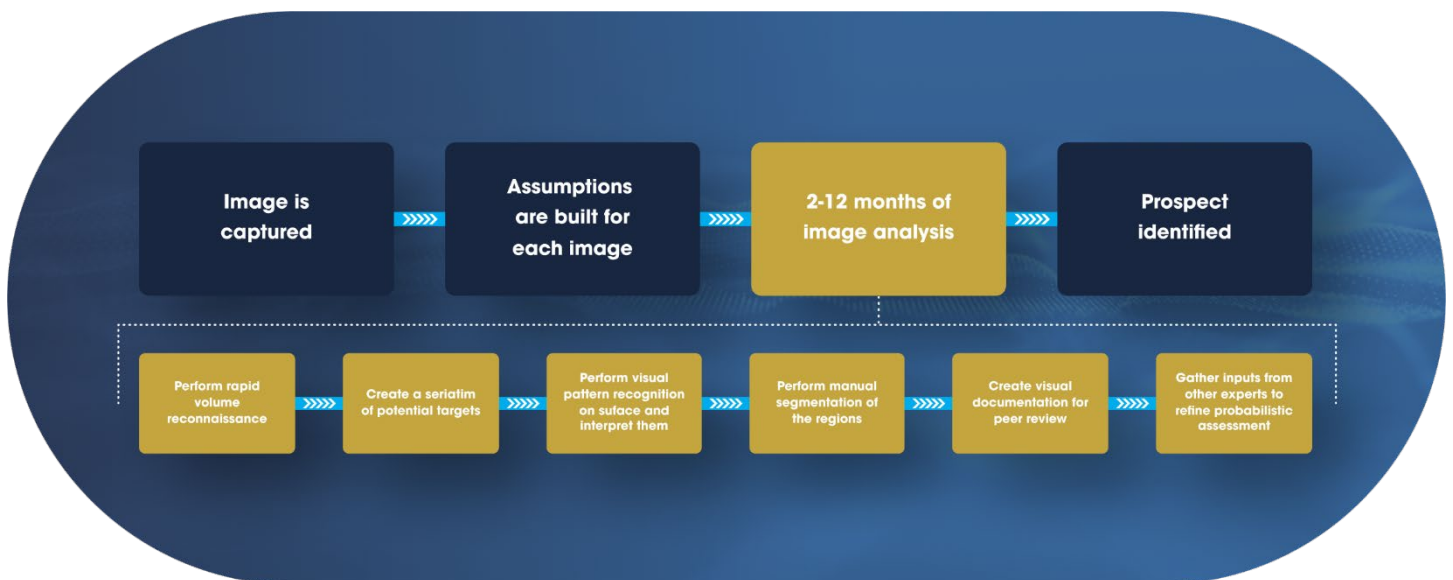


Seismic analysis is the most common process currently used to identify subsurface natural resources, such as oil or gas deposits. Successfully identifying these deposits represent billions of dollars in potential profit for oil, gas, and energy producers.

Correctly predicting the location of these accumulations is both an extremely time consuming and highly complex process. It involves utilizing highly trained specialists who need to analyze hundreds of km³ of detailed geospatial image data. The accuracy of the predictions they make is critical. An incorrect prediction represents billions in missed opportunities and a massive, wasted capital investment of **\$100M or more**.

In order to maximize the success of these predictions, oil and gas organizations invest months in highly complex and time-consuming imaging analysis that not only creates a massive bottleneck in the full geoscience decision workflow, but typically only achieves a **30% success rate** in correctly predicting the location of these valuable deposits.

The Seismic Analysis Workflow



True resolution deep learning computer vision can accelerate the seismic analysis process and increase the accuracy of discovery predictions

Deep learning computer vision models have the potential to greatly improve and accelerate the analysis of seismic data by capturing even higher dimensional information, such as amplitude versus offset, as part of the patterns that experts need to identify. This enables organizations to reduce the seismic analysis process from nine weeks to **as little as one week**.



There is limited availability of the specialized labeled data which is necessary to train seismic analysis computer vision models

Computer vision models have the potential to greatly improve and accelerate seismic analysis, delivering significant value to the energy industry.

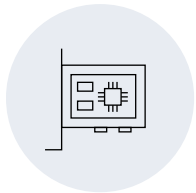
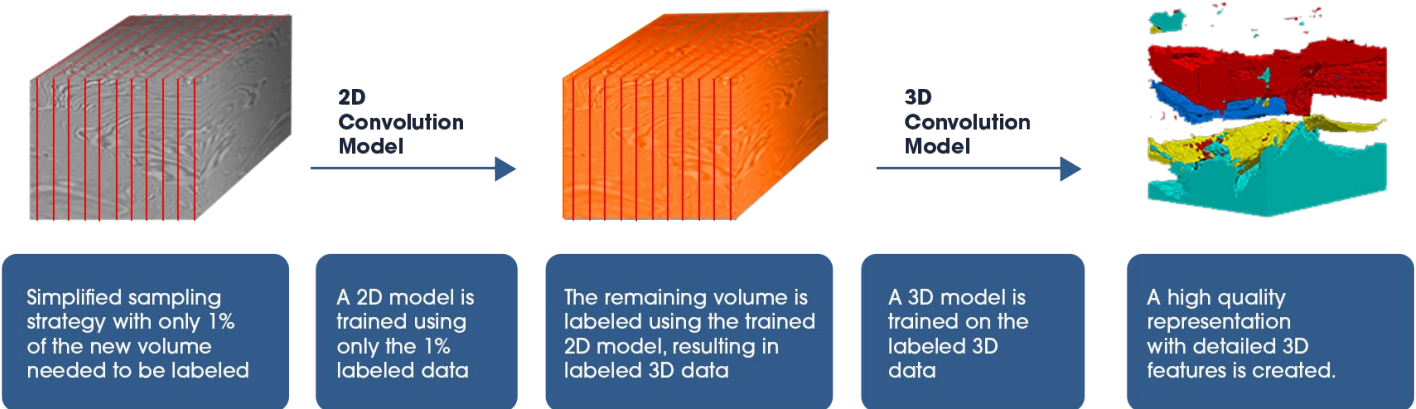
However, training these models requires specialized data labeling of **up to 40%** of the total volume of the massive seismic data sets which can be hundreds of km³ in size.

This labeling process is highly complex, manual, and time consuming. It requires significant effort from subject matter experts who have the training and skills necessary to recognize and label the complex 3D features that are critical to seismic analysis and prediction. However, these experts are almost always focused on analyzing seismic data for predictions, not labeling data.

As a result, most organizations do not have the necessary data needed to train effective computer vision models that can improve the seismic analysis process.

SambaNova significantly accelerates training computer vision models

SambaNova utilizes a proprietary approach that greatly accelerates the complex and time consuming model training process by reducing the labeled data required to train a model by **97.6%**, while simultaneously resulting in more detailed 3D features that can greatly improve the accuracy of the analysis.



Limitations of GPU-based AI infrastructure prevent analyzing high resolution 3D images, impacting accuracy

While 2D networks can be useful for seismic analysis, they can lead to artifacts and complicated post-processing issues that impact usability of the prediction.

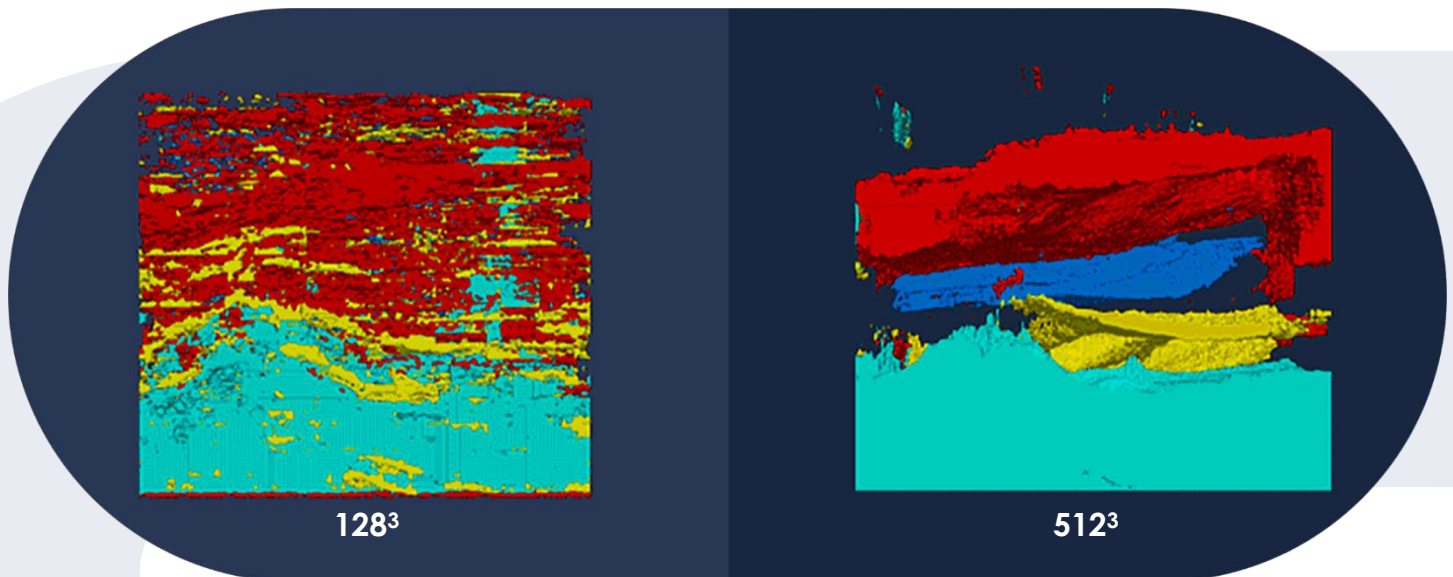
Large 3D networks overcome these limitations by leveraging multi-scale, 3D correlations to identify the most relevant features in the data to improve the quality of the predictions. Many of these features are 3D themselves, so 3D data is critical to identifying them.

However, the 3D image resolution that can be processed with GPU-based AI infrastructure is extremely limited, leading to tiling or lowering the resolution of images, which both increases implementation complexity and significantly impacts accuracy.

SambaNova DataScale® is uniquely capable of handling images of 512³ and beyond

The SambaNova platform eliminates the limitations of GPU based systems that cannot process true resolution images without significant downsampling or tiling, which increases cost and reduces accuracy. The higher memory capacity of the SambaNova DataScale platform enables organizations to analyze images at 512³ resolution and beyond, identifying natural correlations and with higher quality of features, improving downstream analysis and accuracy of results.

The higher quality of features from 512³ resolution images enables seismic analysts to make more accurate predictions, in less time, resulting in billions of dollars of potential profit from the discovery of additional resource deposits



Seismic Data Terms of Use: The New Zealand government collects seismic and well data and releases it to the public after a data confidentiality period of a few years. The purpose of releasing these data to the public is to promote development of New Zealand's petroleum and mineral resources. These data can be used by students, academics, and industry provided publications and presentations acknowledge New Zealand Petroleum and Minerals (NZPM) for providing data.

Label data source: AICrowd




Next steps

If you would like to learn more about how organizations are preparing for the future, visit SambaNova.ai

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Customers turn to SambaNova to quickly deploy state-of-the-art AI capabilities to meet the demands of the AI-enabled world. Our purpose-built enterprise-scale AI platform is the technology backbone for the next generation of AI computing. We enable customers to unlock the valuable business insights trapped in their data. Our flagship offering, Dataflow-as-a-Service™, overcomes the limitations of legacy technology to power the large complex foundation models that enable customers to discover new services and revenue streams, and boost operational efficiency. Headquartered in Palo Alto, California, SambaNova Systems was founded in 2017 by industry luminaries, and hardware and software design experts from Sun/Oracle and Stanford University. Investors include SoftBank Vision Fund 2, funds and accounts managed by BlackRock, Intel Capital, GV, Walden International, Temasek, GIC, Redline Capital, Atlantic Bridge Ventures, Celesta, and several others.