

# Maillance – machine learning on production data

Maillance of Paris and Houston is developing machine learning algorithms to help production engineers make better decisions.

Founder and CEO Jean-Paul Dessap formerly worked in production simulation and optimisation at Schlumberger, including managing innovation programs. He left Schlumberger to start Maillance in 2017.

The company currently has pilot projects running on data from North America, Middle East and Asia, both conventional and unconventional wells, using production data together with reservoir data.

The software aims to spot patterns in data which might help answer questions like “which wells make the best workover candidates,” or “where are the sweet spots in the reservoir for infill wells,” he says.

Companies normally use reservoir simulators to make such decisions. Maillance is designed to work in parallel with standard reservoir simulation, not try to replace it.

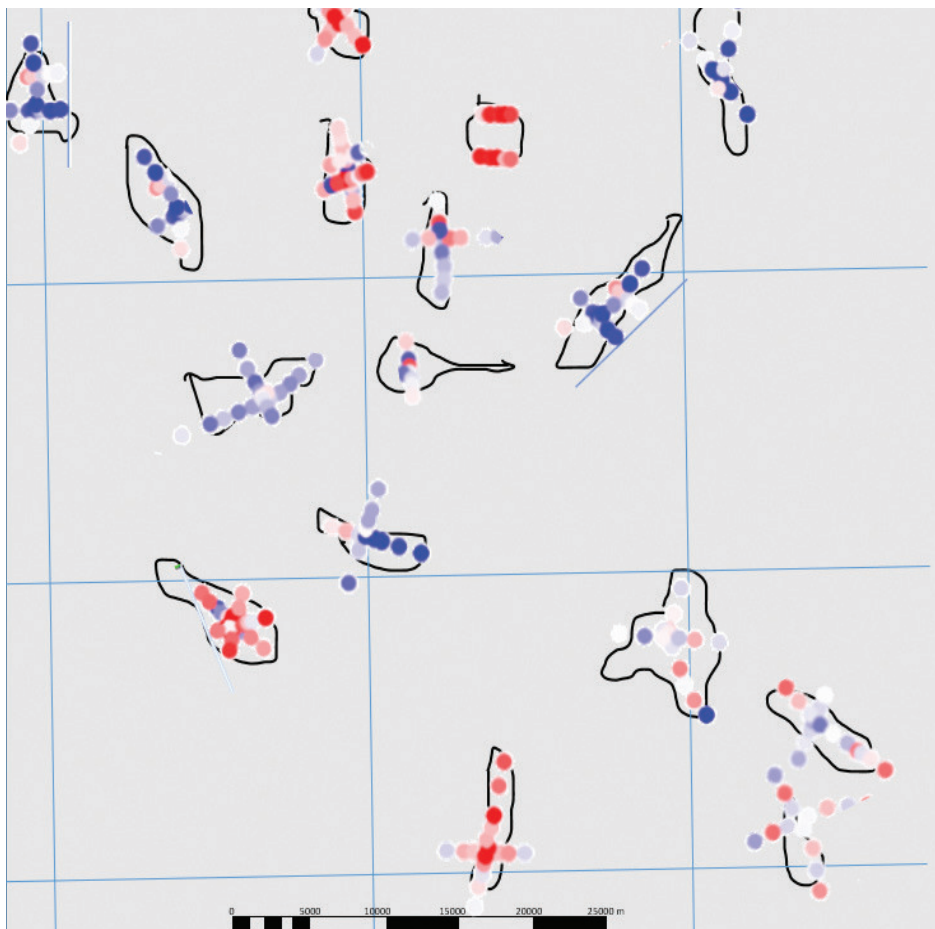
Companies may perhaps not want to execute the recommendations the AI engine makes directly, but they can see it as a source of suggestions worthy of further investigation, he says.

The machine learning tries to find a relationship between “certain features of the problem” and the target, he says.

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# Biodentify – DNA analysis to find oil

Biodentify of Delft, the Netherlands, is doing DNA analysis of microbes from soil and seabed samples to help find hydrocarbons



Biodentify made estimates about whether certain North Sea prospects would be prospective or dry, based on seabed samples. Red = prospective, blue = dry. Figure is realistic but anonymised

The company takes advantage of big advances in DNA profiling technology over the past years, which can analyse the DNA from any physical sample. DNA profiling is used to analyse cancer tumours, assist criminal investigations, and analyse parentage and ancestry.

The technique is used by Biodentify to analyse the microbes found in a soil or seabed sample above a suspected reservoir.

All oil and gas reservoirs leak slowly, which

means that there is a slightly higher presence of hydrocarbon (gas) in the soil above reservoirs. These hydrocarbon gases can be very difficult or impossible to detect directly, because the concentrations are so low, but they do show up in the mix of microbes which you find feasting on the gas in the soil.

The effect also works in reverse – there are microbes you would normally expect, but which do not thrive in the presence of hydrocarbons.

The company uses artificial intelligence techniques to map the prospectivity according to the microbes present in the sample. This can be known as its ‘DNA fingerprint’. The basic idea is that you might find a similar cluster of microbes above two adjacent hydrocarbon reservoirs.

There are hundreds of thousands of different types of microbes, not all of which have been labelled, says Mart Zijp, Head of Operations with Biodentify. So instead they can be labelled with a DNA related code.

The system usually needs a minimum of about 50 differentiating microbes which are affected by the microseep present to work, Mr Zijp says.

There are some microbes which are commonly found above a hydrocarbon filled reservoir, with the same microbe found above reservoirs which are not in the same basin, even on opposite sides of big oceans.

The seabed samples can be taken <1m depth into the seabed, with a “drop coring technique”. Onshore samples are usually taken from about one foot depth. They need be no larger than “half a teaspoon” in size, he says.

The company has done a number of pilot projects, where an oil company asked it to try to find known reservoirs, by comparing the microbes above a reservoir with the microbes in other parts of the region.

The company has done 6 projects in the US, and also projects in the Dutch and Norwegian sectors of the North Sea, and Argentina’s “Vaca Muerta” shale play.

The company is a spin-out from Dutch research organisation TNO in 2014. Its website is [biodentify.ai](http://biodentify.ai).

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