AUTOMATED AND ACCURATE EVALUATION OF BIOTURBATION INTENSITY FOR OIL & GAS APPLICATIONS

INVENTION

Bioturbation, a biotic reworking of sediments, can affect important characteristics of petroleum reservoir such as density, porosity, and permeability. Bioturbation experts are relied on for the measurement of bioturbation intensity of oil and gas reservoir. However, up till now, they use manual methods. Hence, this invention is about an application for the automated determination of bioturbation index of a core sample. It can be used in the field and in the laboratory.

MARKET SIZE AND GROWTH

Bioturbation is one of the measurement carried out during reservoir characterization or core logging. The global reservoir analysis market size is projected to increase from USD 8.18 billion in 2018 to USD 11.96 billion by 2026[1]. Data acquisition and monitoring accounts for the largest fraction of the market, about 46 %.

APPLICATIONS

The invention is useful for determining bioturbation intensity of a reservoir or formation. It can be used by oil and gas service companies for core sample characterization and by testing equipment manufacturer for new testing device.

ADVANTAGES

- Accurate (98%) evaluation of bioturbation intensity compared to manual method.
- Consistent measurement.
- Consumes far less time compared to manual method.
- Low cost of measurement.

PROJECT STATUS

- Machine learning model was developed, trained, and tested.
- A prototype in the form of an application was developed and used to carry out tests on core samples images.

Fig. Examples of expert-labelled training images used in the algorithm[2]

LOOKING FOR DEVELOPMENT PARTNER

We are looking for industry feedback. We are also looking for a company who can partner with us for software development and field testing of the invention or. Our ultimate objective is to license the intellectual property (IP) to a company or a start-up for commercialization.

PATENT PROTECTION

A patent application US17563741 covers the method of using geological images with known bioturbation index to classify core samples into different classes. The IP is owned by King Fahd University of Petroleum & Minerals (KFUPM).

ABOUT KFUPM

KFUPM is located in Dhahran city of Saudi Arabia. KFUPM currently ranks at 163 in QS World University Rankings 2021.

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[1] ww.fortunebusinessinsights.com

[2] https://www.mdpi.com/2076-3417/11/16/7736