Application of data analytics and (semi-)supervised learning techniques to gas production data

Publieke samenvatting / Public summary

Aanleiding

Interpretation of gas production data is increasingly complex due to end-of-field-life dynamics and growing data availability due to digitization and instrumentation. On the other hand, lower margins require early diagnosis and remediation of production issues, while less (experienced) operators are available to perform these tasks. Big data analytics combined with (semi-)supervised learning techniques can detect and qualify production anomalies faster and at lower costs, while the results of the analysis are more repeatable and less dependent on (deviations in) human interpretation. Adoption of new data analytics tools and techniques in the oil and gas industry is limited due to, • specific challenges with respect to data quality and uncertainties; • insufficient competencies and relevant skills regarding “big” data analytics (e.g. selection of correct algorithms, physical explanation of results, etc.) • lack of relevant success stories, (business cases) which might help in overcoming non-technical barriers (for instance cultural and legal barriers towards data sharing).

Doelstelling

This proposal aims to demonstrate the application of (semi-)supervised learning techniques to dynamic and uncertain gas production data for diagnosis of off-normal production behavior. A secondary objective is to enhance the adoption of big data

Projectinformatie / Project information

Projectnummer / Project number
TKITOETKI2018-01-GE
Subsidiebedrag / Grant amount
€ 98.039,00

Algemene informatie / General information

Penvoerder / Secretariat
TNO

Publicaties en materialen / Publications and attachments

- **14.01.2021**

  Eindrapport Data Analytics (TKI2018-01-GE)

Volg Topsector Energie op X / Follow Topsector Energie on X

@TSEnergie

analytic techniques and explore potential applications in the Dutch gas production sector.

Korte omschrijving

In order to meet the objectives, the following work-packages are proposed: WP 1. Survey of methods for pattern recognition / semi-supervised learning and method selection WP 2. Use case selection and definition WP 3. Data collection, pretreatment and interpretation WP 4. Method demonstration in field cases / using field data WP 5. Workflow development and knowledge sharing In WP 1-4 of the proposed project early detection of off-normal events in (real-time) production data and of automated diagnosis of these events will be addressed and demonstrated. WP5 aims to build and transfer knowledge on data analytics techniques and their benefits for Dutch gas production.

Resultaat

This project will deliver: a) Demonstration of machine learning techniques to dynamic and uncertain (mature gas) production data for the detection of off-normal production events b) A generic approach to apply supervised learning techniques in NL mature gas assets c) An inventory of potential applications for big data analytics in NL mature gas assets d) White paper on the application of data analytics, specifically anomaly detection, in NL mature gas assets

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
Voor meer informatie over de Topsector Energie, ga naar **www.topsectorenergie.nl**.

Voor meer informatie over de TSE / Energie-Innovatie regelingen die RVO aanbiedt, ga naar **www.rvo.nl/tse**.