https://www.og21.no/en/strategy-and-analyses/og21-studies-and-analyses/this-years-deep-dive-study/

This year's deep dive study

OG21 conducts every year a study on a topic of particular strategic interest for the Norwegian petroleum sector. This year the selected topic is machine learning in the petroleum industry.

The OG21-study in 2019, "Technologies for cost and energy efficiency", illustrated the importance of digital technologies to create value on the Norwegian Continental Shelf (NCS), for instance as enabling technologies for unmanned platforms, condition-based maintenance and field model optimization.

This study will examine how the petroleum industry in Norway could leverage the potential in machine learning. Tasks include:

- Discuss and define relevant terms such as Artificial Intelligence, Machine Learning, Deep Learning, Automation and Robotics and how these relate to each other.
- Describe types and depths of ML and typical applications of different types of ML
- Describe the current status on:
    1. How ML is applied in the Norwegian petroleum industry. Provide case examples.
    2. ML competence and capacity in the Norwegian petroleum sector. It includes a discussion on how necessary competencies need to be brought together to realize ML opportunities, see figure below.
    3. Ongoing ML R&D and collaboration efforts in the petroleum sector in Norway and internationally.
- Describe *specific problems* within the Norwegian petroleum industry that ML could be used for solving.
- Discuss scale effects of data and computational power, and which type of ML and scale of data and computational power that would be needed or sufficient to solve the identified *specific problems*.
- Describe how ML could assist the Norwegian petroleum industry to achieve OG21's strategic objectives on environment, resource utilization, costs and productivity, industry development and competence.
- Describe ML R&D funding opportunities nationally and in the EU and how these opportunities relate to the identified *specific problems*.

- Describe risks associated with ML, including risks related to safety critical systems and security.
- Describe how risks could be mitigated or managed through model development, access to and quality of data, human in the loop, etc.
- Describe challenges and hurdles associated with the adoption of ML and with achieving the full potential of ML, e.g. related to competence, organization, industry structure, regulations, market and dynamics between collaboration and competition.
- Describe possible measures to stimulate development and adoption of value-adding ML in the Norwegian petroleum industry. Technology, business models, collaboration, regulation etc.

The results will be used for:

- Demonstrate to NCS stakeholders the importance of machine learning to maintain competitiveness.
- Identify areas where machine learning is of particular high importance to improving the NCS competitiveness.
- Provide proof and arguments for OG21's communication on the need for increased research and technology development.
- Stimulate to increased collaboration on the development and use of machine learning.

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