FUNDING DETAILS

Digital Technologies in Reservoir Interpretation and Production Prediction

It is necessary to develop digital technologies that provide crucial insight into the large data sets available today to help select optimal petroleum recovery scenarios. In this project, machine learning (ML) technologies will be developed for reservoir exploration, reservoir property investigation, and production prediction. Through the development of these ML technologies, we will deliver a novel reservoir interpretation and production prediction workflow together with Tartan Energy Group Inc. These technologies offer the promise of transformational solutions to the economic and environmental challenges in the recovery of heavy oil and bitumen resources while training much needed advanced digital skills within Alberta.

RECIPIENT:

University of Calgary – Zhangxing (John) Chen

PARTNERS:

Tartan Energy Group

TOTAL BUDGET:

$459,200

AI FUNDING:

$200,000

PROJECT DATES:

MARCH 2020 – AUGUST 2021

PROJECT TRL:

**Start: 1-3
End: 4-6**

APPLICATION

This project will advance Reservoir Engineering through artificial intelligence techniques such as machine learning. Machine learning can leverage historical relationships between logging responses and various components of a reservoir to provide an intelligent system for performing reservoir interpretation. Machine learning empowered history matching will provide fast, quality validations and global robustness. Reservoir production prediction and optimization using these new techniques will be efficient in maximizing oil recovery processes while reducing environmental impacts.

CLEAN RESOURCES

ADVANCED HYDROCARBONS

CLEANER HYDROCARBON PRODUCTION - DIGITAL OILFIELD

PROJECT GOALS

- Automatically classify water, oil and gas layers based on well logging curves using machine learning
- Create a system that automatically interprets reservoir properties based on a curve that combines reservoir parameters such as porosity, permeability, and oil saturation and can compare all well logging curves to determine the type of a reservoir
- Create a system that will suggest optimal parameters for a reservoir model using data driven techniques to improve the history matching process
- Create a system that leverages all data to support production optimization and reduce environmental impacts that is tested and verified on a variety of datasets
- Integration of the system with existing tools created by the Reservoir Simulation Group at the University of Calgary.

BENEFITS TO ALBERTA

- Alberta has a unique opportunity to combine strength in oil and gas innovation with emerging technologies. The confluence of these two industries is the ideal place for innovation, as it follows the path of least resistance by advancing an incumbent sector while creating future opportunities and growth.
- Will directly advance innovation in reservoir simulation in Alberta, providing tools that can improve the ability to simulate and evaluate any kind of reservoir simulation scenario including new and emerging extraction techniques.
- Reduces the time to adoption and improve the chance of adoption of new, more sustainable, petroleum extraction technologies.
- Graduate engineering students will be trained in complex machine learning technologies applied to the petroleum and digital industries that are entirely transferable to other industries.

2 Publications

3 Students Trained

3 Project Jobs

CURRENT STATUS

APRIL 2020

The project started in March 2020. Equipment is being purchased and work is progressing in benchmarking and validation of logging interpretation and history matching techniques.