Master Theses at NTNU in collaboration with Future Well Control

About the Company and Innovation Project Description

The master theses will be carried out in close collaboration with Future Well Control AS (FWC). FWC is a small start-up company based in Kristiansand and founded in 2015. FWC specializes in drilling technology and well control. Our main activity is within R&D and our goal is to develop new improved products for influx detection, riser protection and drilling technology in general.

The master theses will be part of a larger Innovation Project for the Industrial Sector named Drilling Advanced Influx Detection (Drill*Aid*™) led by FWC. The Drill*Aid*™ project is a three-year project (2018-2020), planned to start beginning of January 2018 with funding from The Research Council of Norway and in collaboration with Lundin Norway AS, MHWirth AS and NTNU.

Master Theses Description

The master theses will be based on a paper **OMAE2017-62205, Estimation of Undisturbed Geothermal Gradient in Wells from Measured Drilling Data: A Numerical Approach** (Lucas C. Sevillano, et al. 2017). This numerical approach is based on an in-house (NTNU) axisymmetric wellbore transient thermal model, in which the equations are solved using the finite difference method, see figure 1 below taken from the same paper.
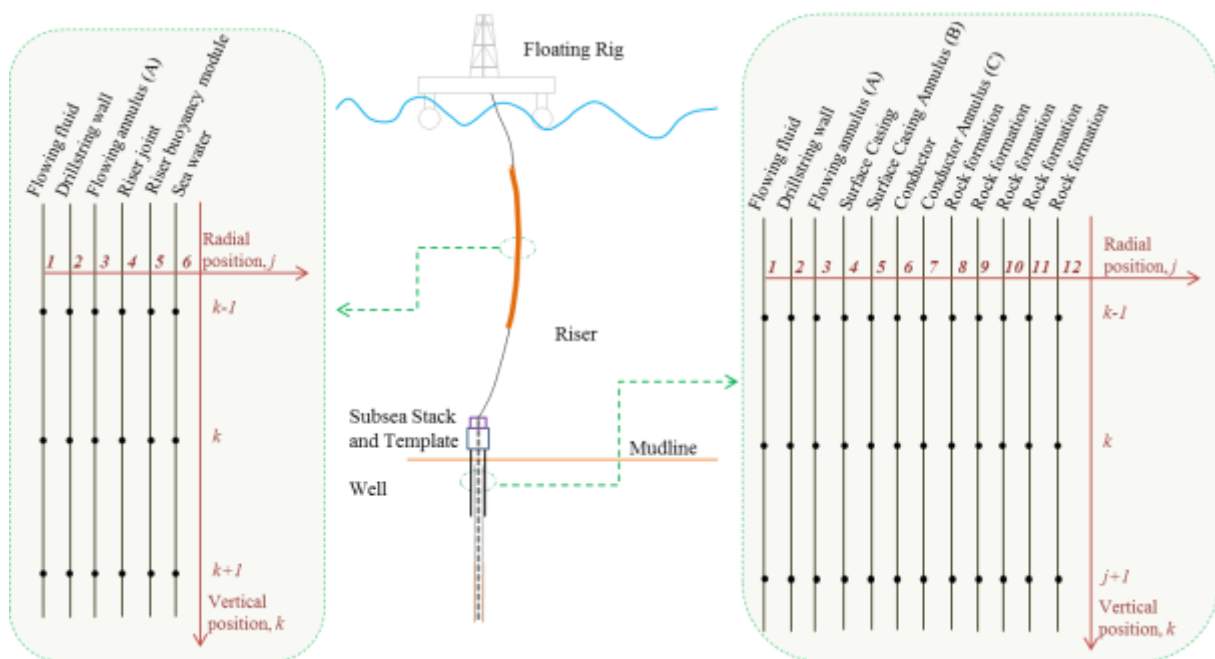

Figure 1 – Schematic representation of well system's mesh

The main objective for the master theses is to find out how to accelerate the code made in MATLAB to be able to use the transient thermal model in real-time applications. Possible approach/solutions to accelerate the computational speed are:

- Rewrite the code into C, C++, Fortran or Python
- Optimize the code with respect to computational speed
- Optimize no. of grid points (mesh)
- Accelerate the computing speed by use of graphics processing unit (GPU) programming.

A second objective for the master theses is to benchmark the final code against commercially available software such as Drillbench (Schlumberger software).

About You

Our ideal candidate will be (or possess):

- Final year Master student in **Industrial Mathematics**, **Applied Physics and Mathematics** or **Industrial Cybernetics**.
- Able to demonstrate practical experience with software development.
- Familiar with C, C++, Fortran or Python.
- Familiar with general purpose GPU programming.
- Excellent written, verbal, and presentation skills in English.
- Excellent verbal skills in Norwegian.
- Positive attitude and strong interpersonal skills.
- Enjoys collaboration and working in team.
- Great working capacity and able to work under pressure.
- Interesting in working for Future Well Control AS and continue working in the Innovation Project Drill*Aid*™ after the Master Theses is completed.
- Able to demonstrate healthy attitudes towards; Health, Safety, Security and Environment.

We will encourage qualified female students to apply for this Master project.

General Info

The Master Theses will be carried out in Trondheim and supervised by NTNU however in close collaboration with Future Well Control AS in Kristiansand. Work- and progress-meetings will be both in Trondheim, Kristiansand and remotely using Skype for Business. The main supervisor from NTNU will be decided after the right candidate for the Master project has been chosen.

Contact Info

If you are interested or require more information, contact Dag Vavik at Future Well Control AS, Phone: (+47) 90 63 00 95. Or send a mail/application with CV to: contact@futurewellcontrol.com as soon as possible or **1st of December 2017** at the latest.