OptiDrill: Optimisation of Geothermal Drilling Operation with Machine Learning

Geothermal drilling industry faces various challenges such as poor overall drilling confidence and performance, and lack of bottom hole awareness resulting in NPT, tripping time etc. OPTIDRILL concept was born to address and solve problems in drilling for geothermal resources that increases uncertainty and well construction costs. OptiDrill's innovative drilling advisory system is based on a combination of enhanced monitoring systems, multiple data-driven ML modules, each being responsible for either analysis, prediction, or optimization of one aspect of drilling or completion process.

OPTIDRILL consortium, brings together highly experienced drillers, drilling project managers, engineers and operators, each having a different, yet complementary set of expertise in differing geological conditions, operating parameters and production end-goals. They will be providing data from various wells around the world.

An enhanced monitoring system will be developed based on real time MWD systems as well as acoustic and vibration sensors. The automated machine learning analysis method will predict drilling parameters, using a real-time monitoring and optimization tool, as a unified system combining existing data and the newly developed methods, and finally, a coupled drilling optimization models to reduce overall geothermal drilling and production cost. The goal is to advise and support drilling operators in making informed decisions through realtime data, reducing many of uncertainties associated with drilling, which in term leads to less NPT, as the drilling can be more readily optimised to maintain good ROP, borehole control and address possible drilling issues, before they could impact operation. The OPTIDRILL Advisory System is NOT an attempt to just fully automate drill rig operations, but rather to enhance and digitize decision making and reporting, instrument and optimize the drilling process, and share and transfer this learning across subsequent future application.

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OptiDrill Project Consortium

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