Model-Based Hookload Monitoring and Prediction for Drilling Rigs using Neural Networks and a Forward-Selection Algorithm

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1 - Data Acquisition Phase
Using mud-logging systems sensor data are collected. Examples: Hookload, Block Position, Bit Depth, Flow In, Flow Out, Pump Pressure, Hole Depth.

2 - Features Generation Phase
Physical features are calculated from the sensor data. Examples: Block Speed, Acceleration, String Mass, Bit Speed, Bit Acceleration, etc.

3 - Training/Features Selection Phase
Completely connected neural networks were combined with forward selection method. 3 features out of 23 were identified as important for hookload modeling.

4 – Prediction Results
The results show accurate prediction of the hookload data with average errors of 2 tons.