

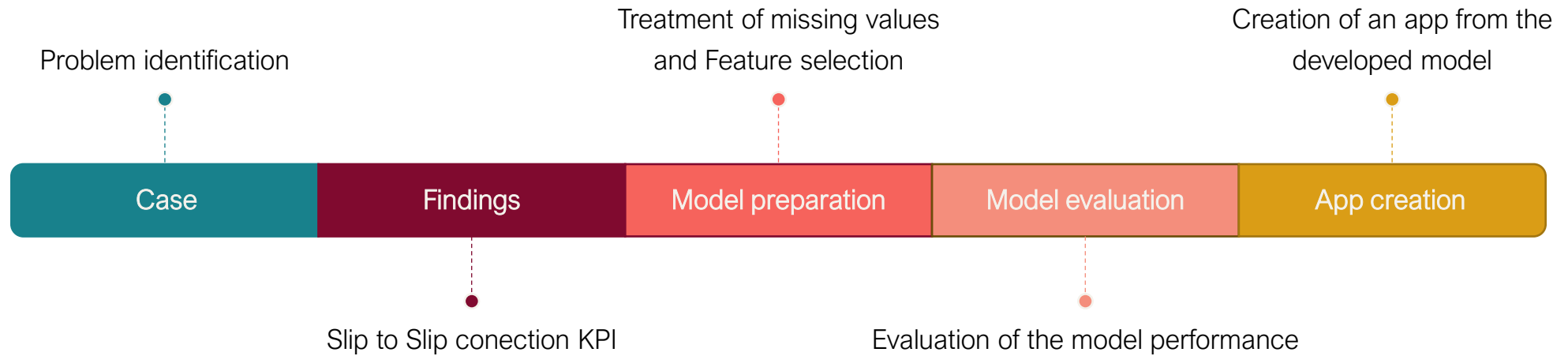
A photograph of the Aurora Borealis (Northern Lights) over a snowy, rocky landscape. The aurora displays vibrant green and yellow-green bands against a dark, star-filled sky. The foreground shows dark, snow-covered rocks and a smooth, icy surface.

Data Scientist Challenge

Márlon Moreira


INTELIE 
A Viasat™ company

Workflow



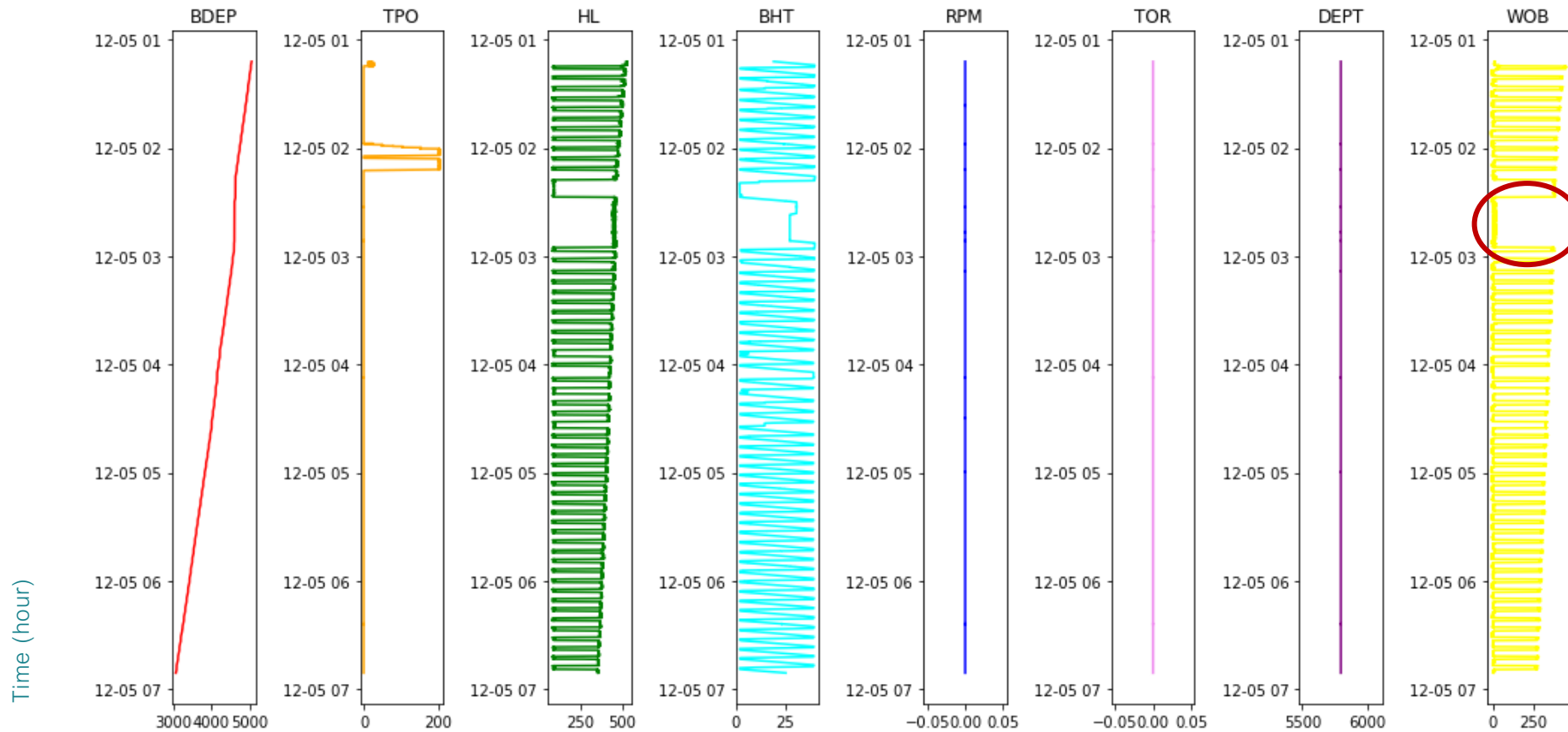


CASE

- 
- One day in the Oil and Gas industry
 - Activity: Drilling Operation
 - Problem: Non-Productive Time in the performance of the drilling machinery (connection between slips and drill pipe)
 - Indicator: Slip to Slip connection time
 - Objective: Identify when the slips is on or off

Findings

SLIP TO SLIP CONNECTION TIME



BDEP: bit depth in m
TPO: fluid flow in gpm
HL: hook load in klbf
BHT: block position in m
RPM: rotary speed in rpm
TOR: torque in klbf-ft
DEPT: hole depth in m
WOB: weight on bit in klbf

Findings

SLIP TO SLIP CONNECTION TIME

Slip Off (time)	
count	55
mean	00:04:10.053963641
std	00:03:20.299865303
min	00:00:17.954999808
25%	00:03:36.531000064
50%	00:03:41.008999936
75%	00:03:50.714499968
max	00:27:54.967000064

Slip On (time)	
count	54
mean	00:01:59.348388882
std	00:01:08.894753649
min	00:01:26.024000
25%	00:01:39.968249984
50%	00:01:43.546499968
75%	00:01:53.753249984
max	00:09:37.049999872

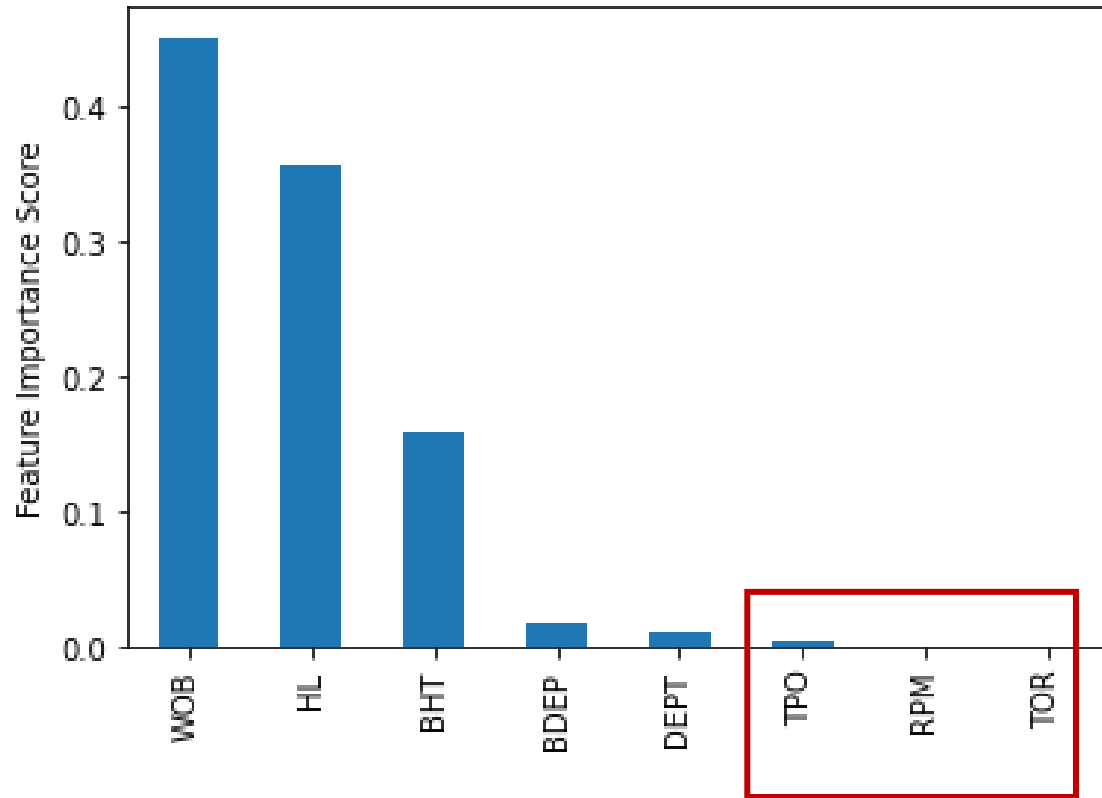
Model preparation

- Treatment of missing values
Strategy: mean imputation
- Feature selection
Exclusion of the variables that only have zeros (TPO, RPM, TOR)
These variables had no correlation with the others and also had no contribution to the model
- An app was built with streamlit to handle online inference

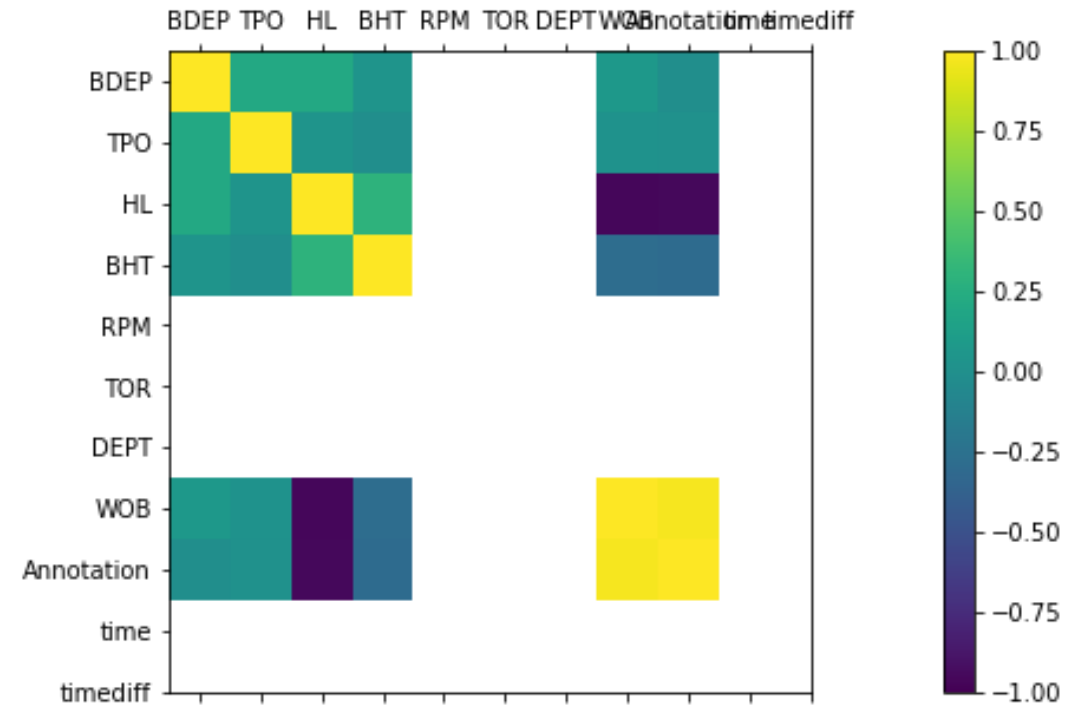


Model preparation

Feature importance

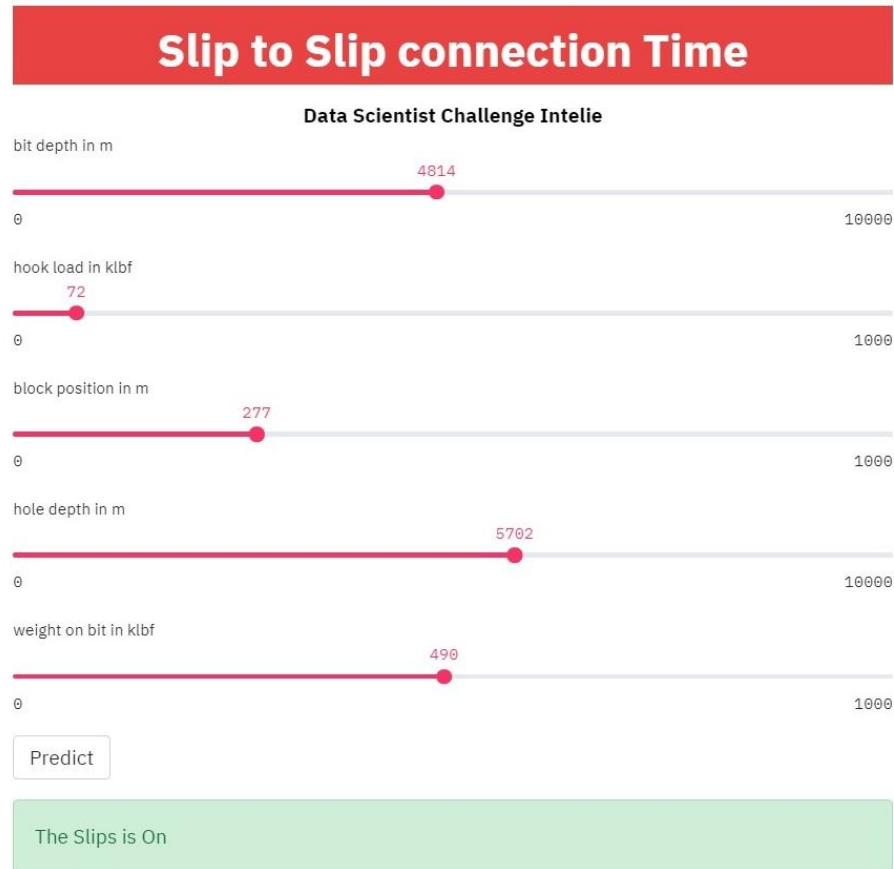


Variables correlation

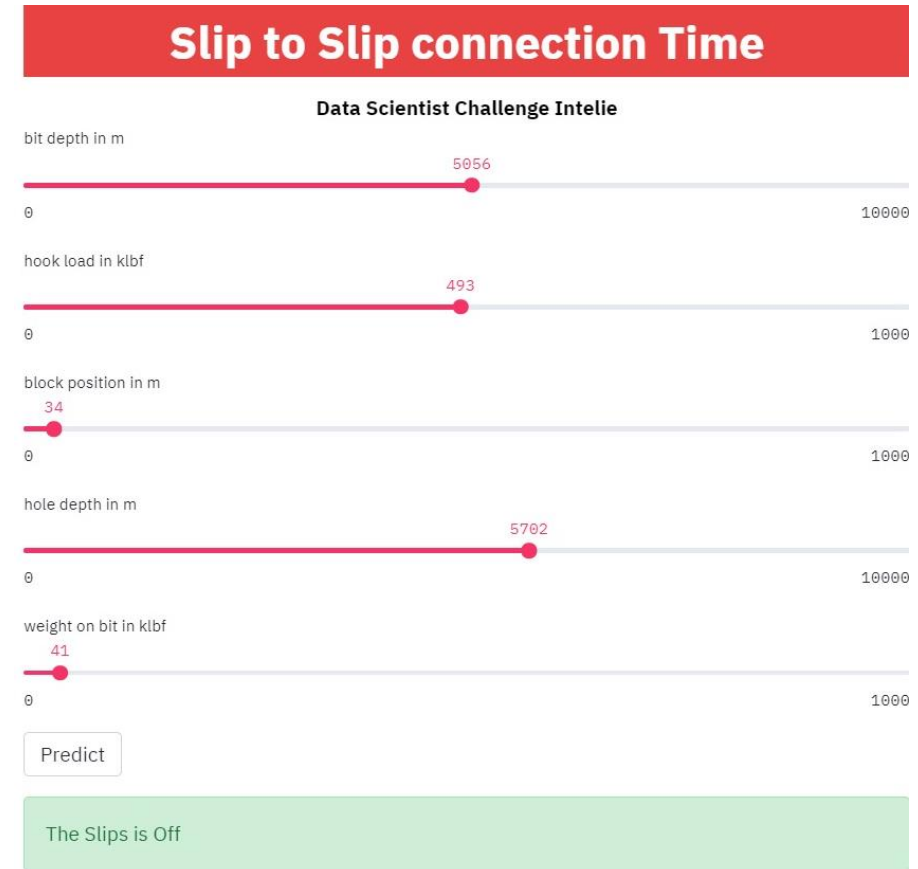


App usage examples

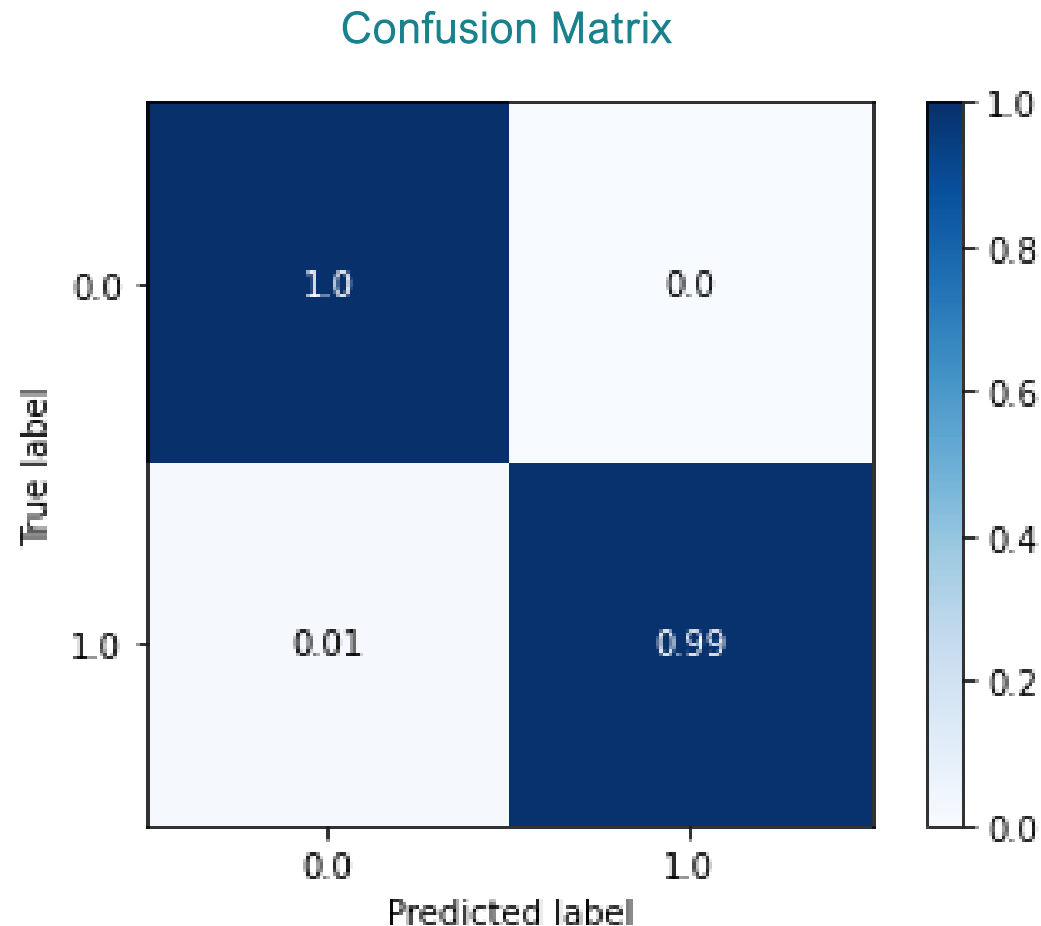
SLIP ON



SLIP OFF



Model evaluation



- The model detect when the slips is on or off;
- In some cases, the model fails to detect when the slips is on.

Thank You

Márlon Moreira

marlonm.almeida@gmail.com

<https://github.com/marlonmoreira1>

<https://marlonmoreira1.github.io/portfolio/>