

## Progress Report

### Industrial Training – Applied Statistics – 2019

Placement: CREATIVE SOFTWARE

Name of the student: H. M. M. S. JAYASOORIYA

Index No: s12916

Duration Considered: from 2<sup>th</sup> of SEP to 13<sup>th</sup> of SEP

#### Brief Description of work carried out

Received a project from the cognite internship program to carry out within 3 months of time. The project briefing is not done yet. It is about reducing the cost of clogging the oil wells belongs to the client **Akerbp**. We are given a python source code named **chalk influx notification system**. It is a module written in python to send notifications to a channel called **slack** when there is a risk of clogging the wells due to excess chalk in the production stream.

The code contains sub modules: -

- Model uploader - upload models for model hosting
- Event generator - generate events to notify
- Event aggregator - aggregate the created events
- Slack notifier - send the notification of events to the slack channel
- Integration testing
- Deployments
- Models
  - Drawdown
  - Drift
  - Max-min-pop-model
  - Mix-density
  - sonos

We analyzed and understood the codes related with the Model uploader, Event generator, Event aggregator and sonos. We did a presentation on the sonos model in front of the supervisors and the industrial mentor to present what we understood about the sonos sub module in a high-level conceptual manner.

#### Problem found and solutions found

- **The code was too hard to understand without proper domain knowledge**  
Requested for some documentations related with the code and found that the code is about 3 methods that **AkerBP** and **Cognite** use to identify a chalk influx event before it happens using data coming from sensors. The first method is by looking for the chalk particles in the production stream and the other two is by measuring the pressure of the valves belongs to the oil wells  
The meaning of **SNR** was not known as it is related to physics rather than statistics. Found that the SNR is a ratio calculate [sound to noise ratio] using a acoustic signal

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Signature of Trainee

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Approved by the Industry Mentor

## Learning Diary

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Week Ending 06 SEP 2019	
Day	Brief description of work carried out
Monday	<ul style="list-style-type: none"><li>Analyzed the <b>Model Uploader</b> sub module of the chalk influx module.</li><li>Learnt how to upload a predictive model to a cloud server for later usage.</li></ul>
Tuesday	<ul style="list-style-type: none"><li>Continued understanding the <b>Model Uploader</b>.</li><li>Learnt how to test a model present in the cloud and to clean up the model from the model hosting cloud when they are not needed in the cloud.</li></ul>
Wednesday	<ul style="list-style-type: none"><li>The <b>Event generator</b> code was analyzed.</li><li>Learnt how to create an event when an anomaly is detected in the oil refining wells.</li></ul>
Thursday	<ul style="list-style-type: none"><li>Analyzed the <b>Event Aggregator</b> code.</li><li>Learnt how to aggregate events before sending them as a notification.</li></ul>
Friday	<ul style="list-style-type: none"><li>Started to learn the models created to predict the risk of having a chalk influx in oil wells.</li><li>Did run the codes in a file called <b>sonos-dev.ipynb</b> and understood that it refers to filtering some sound signal and calculate a value called <b>SNR</b> in order to check whether the chalk particles are present in the production stream</li></ul>

Week Ending 13 SEP 2019	
Day	Brief description of work carried out
Monday	<ul style="list-style-type: none"><li>• Did run the codes in a file called <b>set_SNR_dev.ipynb</b> which belongs to the sonos model.</li><li>• Found that the code is about creating a polynomial regression model to define the SNR limit for a new oil well.</li></ul>
Tuesday	<ul style="list-style-type: none"><li>• We did a presentation about what we understood about the sonos model to the supervisors and the mentor.</li><li>• We were instructed to develop a conceptual diagram to depict the whole process of the chalk influx module.</li></ul>
Wednesday	<ul style="list-style-type: none"><li>• Started analyzing the other models</li><li>• Did run a python notebook called <b>Drawdown</b> and found that it is about identifying the risk of chalk influx using the BHP pressure.</li></ul>
Thursday	<ul style="list-style-type: none"><li>• Continued understanding the <b>Drawdown</b> code.</li><li>• Learnt about Vector Autoregression (VAR).</li></ul>
Friday	<ul style="list-style-type: none"><li>• Poya Day</li></ul>

Signature of Student:

Date: 12 SEP 2019