NAIA I4.0

Use of Big Data and IoT to identify energy inefficiencies on industrial plants by studying the data collected from the different plants, lines, processes, machines and operations.

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Detailed monitoring of equipments in industrial plants

A LOT OF DATA

Energy Bills of about 3M€/year

Am I doing well?

What is happening?

Can I do better?

Do I always consume th… way?

Where am I consuming more energy?

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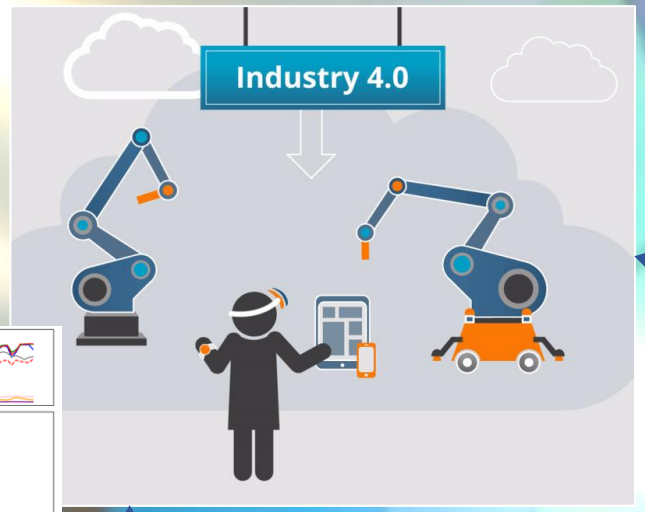
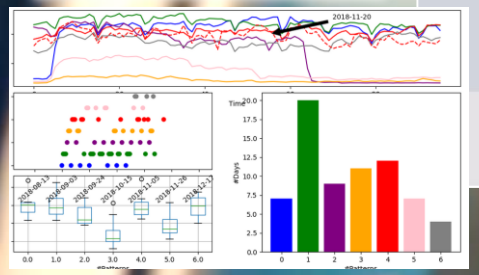


Reports, alarms



Production and Sensors data

EMS/ERP

Big Data

REST API

Processed data and New requests

NAIA I4.0

Production and Sensors data

JAVA REST API SERVER

Main process

Data Access

Algorithm calls

Results Management

NAIA I4.0 Database (MySql)

WSO2

REST Web Server

MySql

Runners

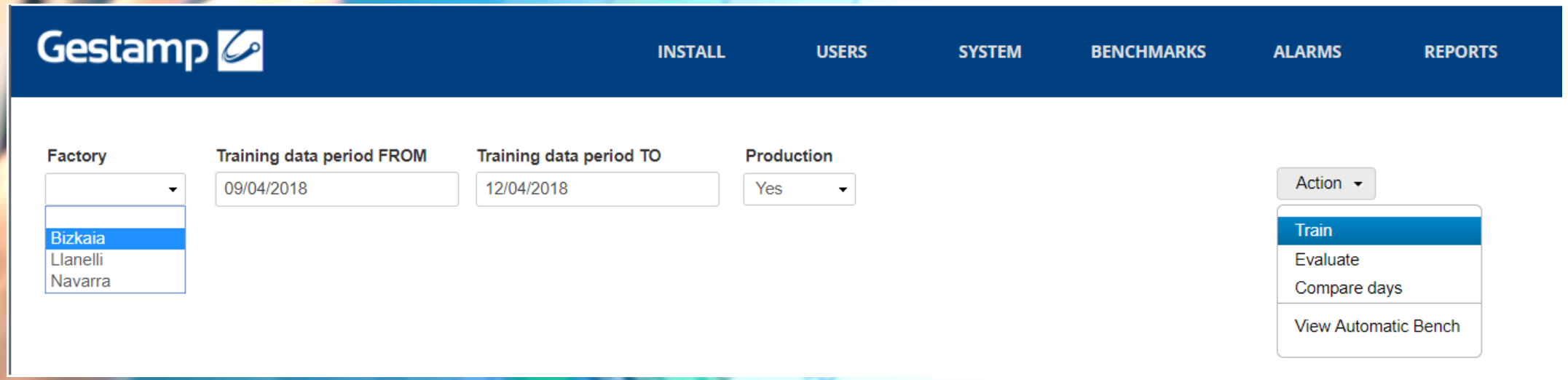
Algorithms and Rest API SERVER (Python)

REST API

Algorithms

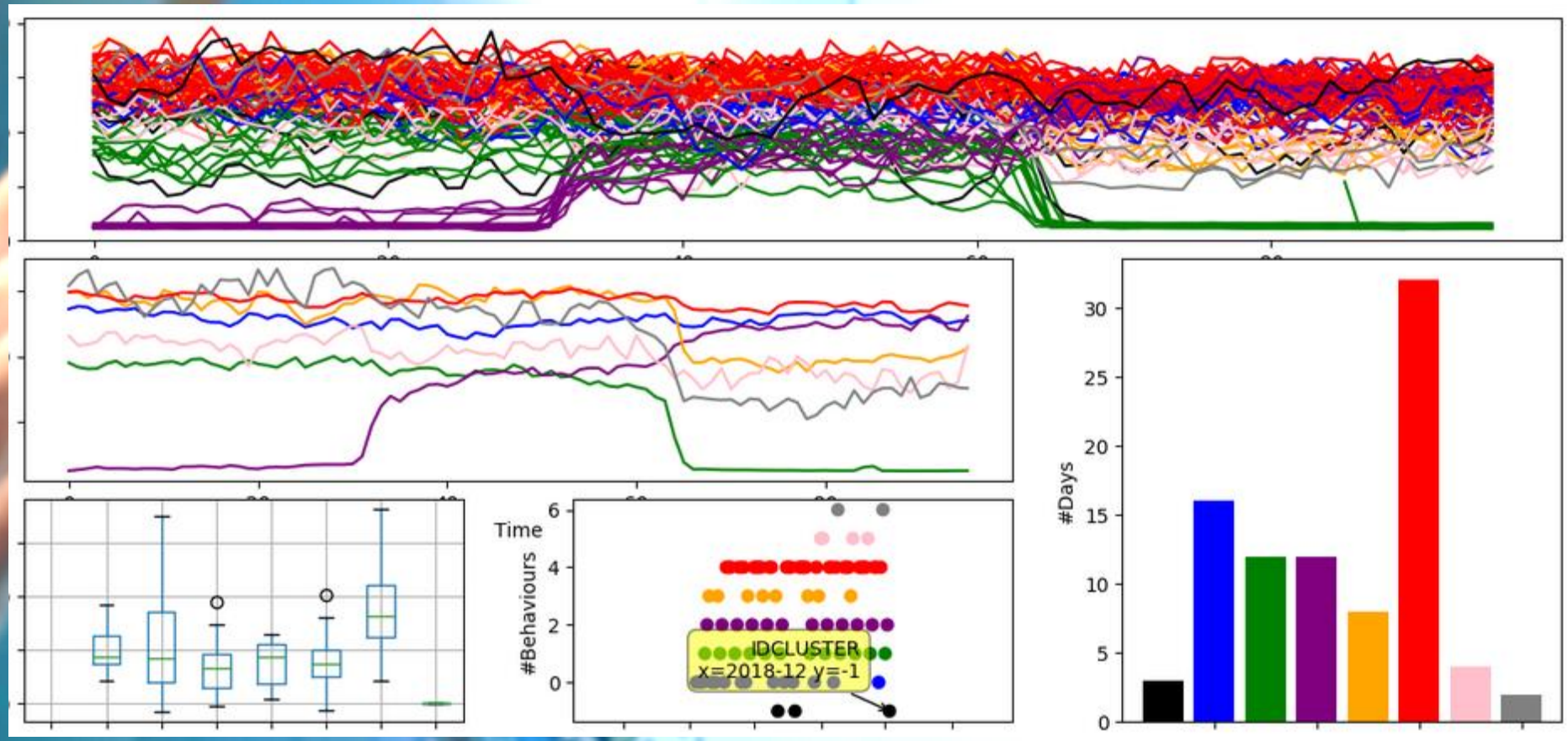
NAIA I4.0 is executed daily in an automatic way for each of the installed industrial plants to check whether they are working as expected or not and why. Daily/weekly and monthly reports are generated where the managers can see the details all of the processes.

Also there is a manual way of executing NAIA I4.0 where the users can select the factory where they want to perform the analysis, the dates and to include or not production data.



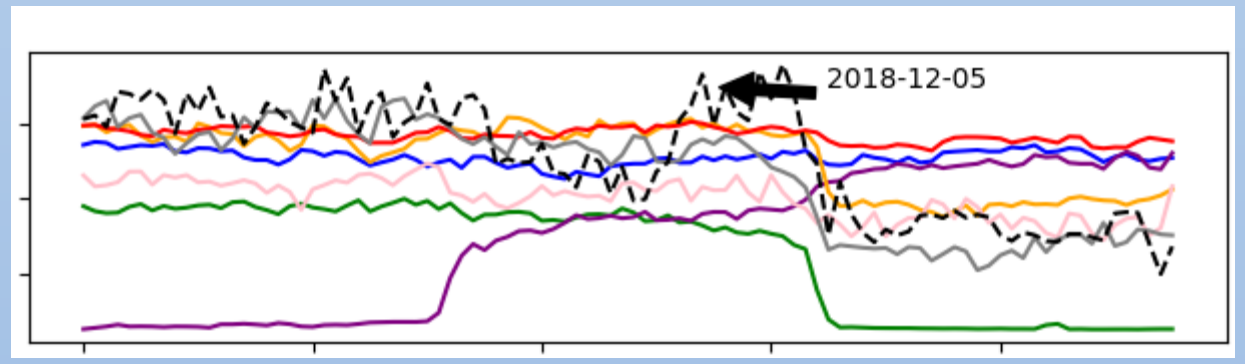
The task of detecting inefficiencies is divided into three main parts:

- Training process: The algorithm takes historic data of the factory and learn which is its normal behaviour (In the following image you can see: Energy consumption curves of 3 months, detected behaviours, days for each behaviour…)

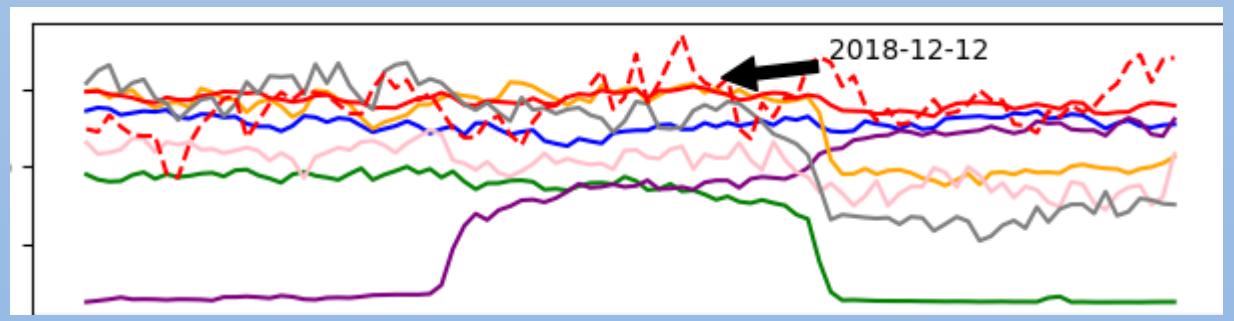


- Evaluation process: Once the training is done, the evaluation process is performed, that consists on taking data of one day and deciding if that day is a normal day or an unknown behaviour.

Energy Consumption data

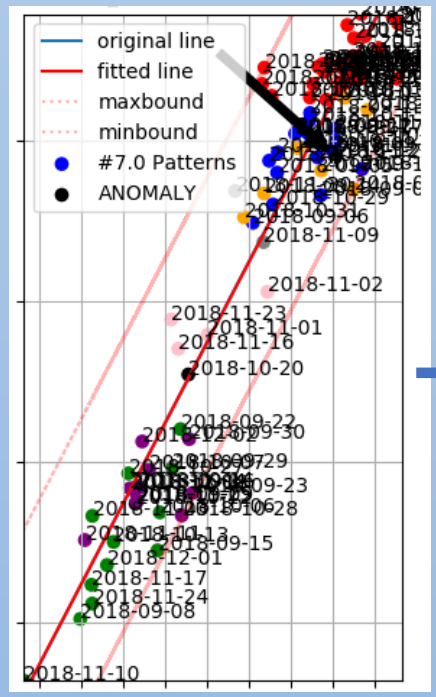


Unknown behaviour

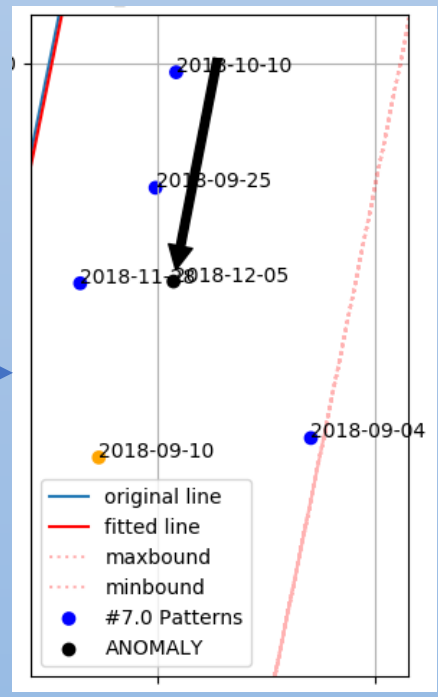


known behaviour

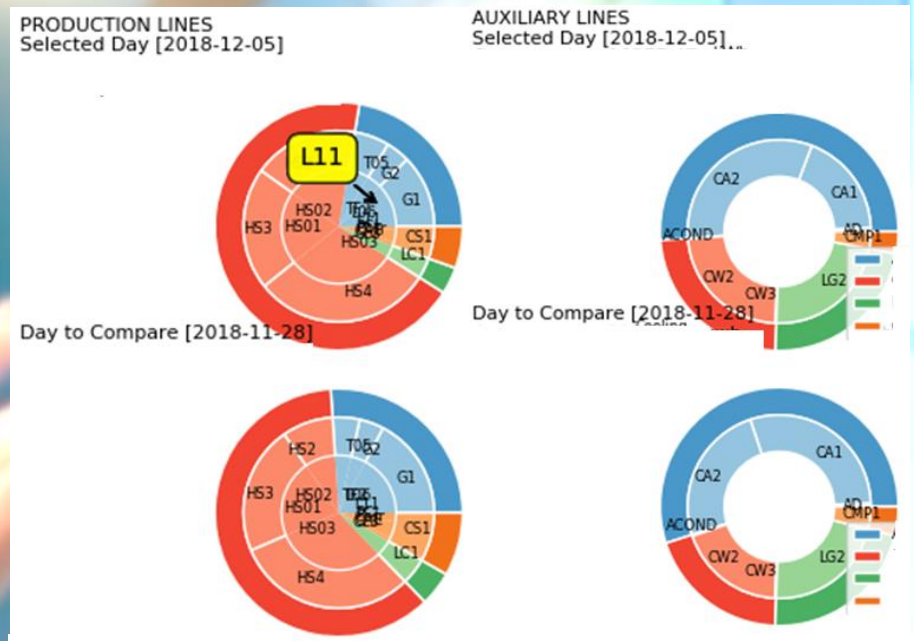
Production data

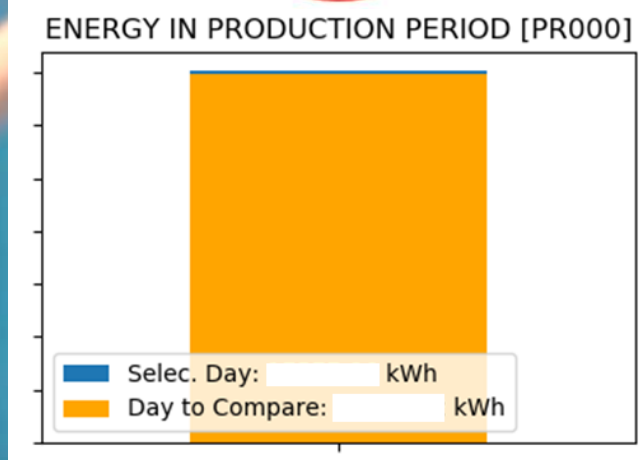


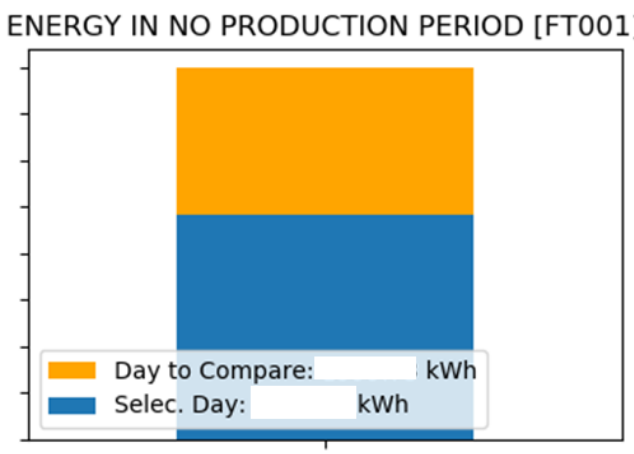
Zoom



- **Evaluation process**: Once the evaluation is performed, the user can compare any day with the best day.







Result of the comparation – Aggregated data

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