

H2020 SOCIETAL CHALLENGES

Climate action, environment, resource efficiency and raw materials

The Industrial Problem

Development of a system that, through the platform of remote management of facilities OTEA, is able to predict maintenance incidents through the interpretation of the data monitored, and can apply rules that improve the efficiency of the system and extend the life of the equipment.

Research group



Instituto
Tecnológico
de Matemática
Industrial

Universidade de Vigo

Center for technological research in the field on Industrial Mathematics: Modelling, Simulation, Optimization & Big Data (MSO & Big Data).

Company

EcoMT Ecomanagement
Technology



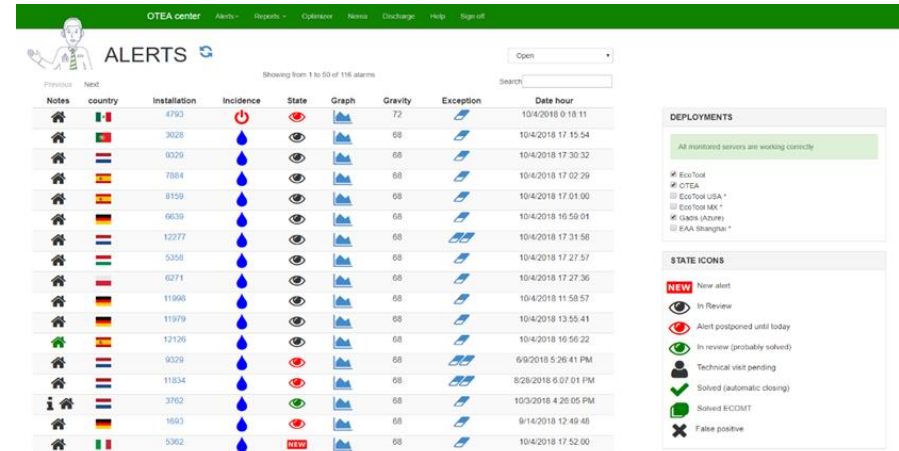
EcoMT creates time saving and tele management solutions compatible with all systems.

Challenges & Goals

To multiply the value of the OTEA system by maximizing the efficiency of the facilities and minimizing the basic management resources.

To deploy a predictive tool which enables to detect maintenance incidents before they happen.

Before this experiment, a deterministic system with brute force conditions was applied to detect comfort anomalies in more than 3,000 installations worldwide. The challenge of this experiment was to replace the brute force solution with a superior performance machine learning algorithm.

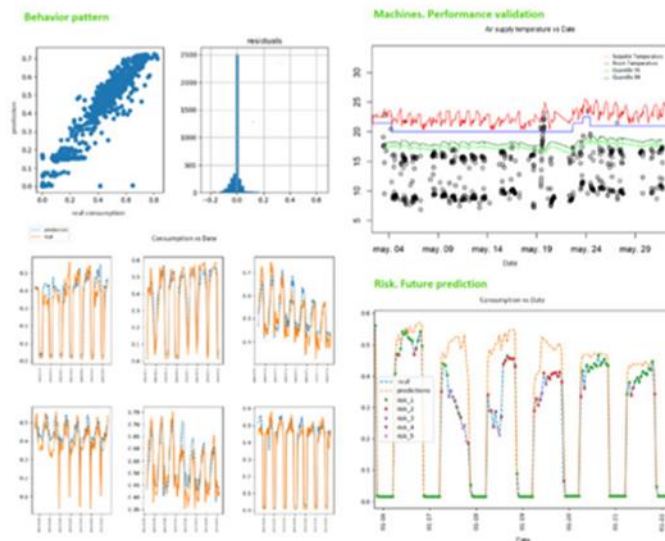


Detection of anomalies by deterministic system

This project was financed in the framework of the call: “Fortissimo 2 - Factories of Future Resources, Technology, Infrastructure and Services for Simulation and Modeling 2”, European Union's Horizon 2020 research and innovation.

Mathematical and computational methods and techniques applied

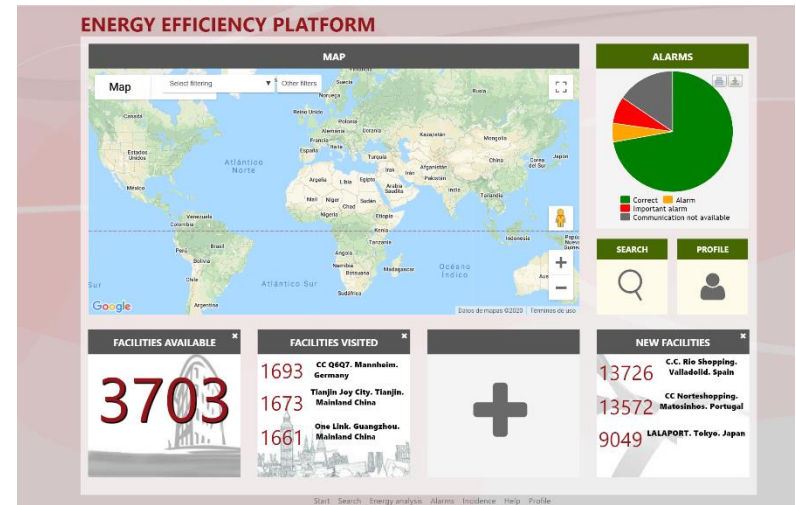
- Use of **Neural Networks**, to predict response variables from observations.
- Use of **Random Forest**, to detect patterns.
- Use of **Quantile regression**, to evaluate the performance of HVAC machines.
- Use of **generalized additive models (GAM)**, to predict the risk of incidence.



Incidence prediction models based on ML and statistical techniques

Results & Benefits to the Company

- The implemented tool created applies mathematical and statistical algorithms in order to get a reliable predictive maintenance, improving the efficiency of the current system, extending the equipment life cycle and allowing a smarter management of resources.
- In addition, an increment of the OTEA platform value has been obtained, and offers a more complete service to the clients whereas the maintenance cost are reduced .
- It is estimated an energy saving of 7% per installation, a reduction of 30% in preventive maintenance visits and a reduction of 20% in corrective maintenance.



OTEA: controls, monitors and manages energy, synonymous of business intelligence

OTEA enables decision support in real time offering a 24/7 service through its control centre.

