itmati — Instituto Tecnológico de Matemática Industrial

PROBLEM DESCRIPTION

Implement improvements in the OTEA platform, developing an algorithm which predicts incidence risk in the air-conditioning system, taking the machine's operating mode into account (cooling or heating).

PRODUCTIVE SECTOR: Energy and Environment

MATHEMATICAL AND COMPUTATIONAL METHODS

Proposed model.

Use of the generalized additive models, GAM, to predict response variables from observations:

As covariables, for modelling the cooling regime, the maximum daily ambient temperature of the previous day, the average daily climate consumption before opening and the member of the last days with incidents are included.

The model for the heating regime includes the number of the last five days with incidents, the average climate consumption before the opening.

CHALLENGES
AND GOALS

Representations of the forecast of incidents on a map to create a heat map for air conditioning system.

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OTEA controls, monitors and manages energy, like a "business intelligence"
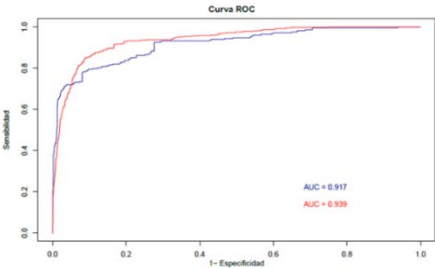
RESULTS AND BENEFITS

The knowledge foundation that has been created is exploited to represent on the map the geographical distribution of the incidents according to size.

It shows, with a high degree of reliability, which commercial premises could pose problems throughout the day.

Through the forecasting of potential incidents, which can be obtained before opening hours, and taking into account the number of machines each shop is equipped with, a list of the stores that are most at serious risk are provided.

Reduction in corrective maintenance costs, which are directly related to failure forecasting in air-conditioning system.

ROC curves for the cooling model (blue line) and for the heating model (red line)

Digital Twin

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ECOMT.
ECOMANAGEMENT TECHNOLOGY

Ecomanagement Technology