

Development of artificial intelligence algorithms for learning about complex dynamic data

Short description (what need was solved?)

Addressing problems of predicting future values of a group of variables of interest, for which no explicit relationship is known, as well as detecting anomalous behaviours over a relatively large set of historical values and in dynamic environments, is a classic and recurrent problem in the field of applied mathematics/computational science. For industry, this class of problems is of special interest, as it makes it possible to obtain predictions, identify behaviour patterns and detect critical events. In this specific case, it is a common factor in all its businesses, associated to problems related to its production assets.

What service(s) provided?

Nowadays, within the area of artificial intelligence (automatic learning and computational intelligence) and particularly in the area of deep learning, alternatives are beginning to be developed to solve the problem of prediction, forecasting and decision making in the presence of complex and large volume data, whose industrial application is promising. These techniques are in the leading edge in the specialized academic field.

We intend to integrate improvements in prediction processes in their industrial systems for decision making: very complex systems in an environment of uncertainty, which imply the management of large volumes of information from heterogeneous sources and often require real-time decision making.

Three lines of work will be established:

- Revision of the state of the art of methodologies necessary to undertake the solution to the problems raised, with special focus on deep learning.
- Evaluation of different alternatives about free software and implementation of the most promising ones.
- Integration of the results obtained in the specific industrial processes.

Relationship with digitization

The handling of large volumes of information, the inclusion of new Deep Learning methodologies and Artificial Intelligence require R&D activity and in general the use of computational resources that can be considered non-conventional.

Customer, details

REPSOL

<https://www.repsol.es/es/index.cshtml>