

ANOMALY PREDICTION IN TENSIONING DEVICES OPERATION OF A COLOR COATING LINE OF METAL UNDER CONDITIONS OF SMALL NUMBER OF FAILURES

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Abstract. The article presents an anomaly prediction model in tensioning devices operation in a color coating line of metal based on the Random Forest machine-learning algorithm with a minimum of precedents in a training data.

The task of the machine-learning algorithm is to predict a normal signal for each motor current using signal values in the current time interval from other motors. Random Forest is used to build models that predict the normal operation of equipment. The model is trained on the data from equipment sensors during its operation. The model is tuned on the data of previous failures of tensioning devices. In order to detect failures, the model analyzes the difference in the readings of the actual and forecast signals at each time point with the selected interval.

The article describes the stages of constructing the model, presents the scheme of a color coating line, and gives information on tuning the model in software specially designed to predict anomalies in the operation of tensioners of a color coating line for metal. There is the developed approach that allows implementing the developed forecasting models at an enterprise quickly and effectively. There is a special translator script to re-train the model quickly in R language and convert the model to C# classes (in which the software is developed).

The developed model makes it possible to monitor the unit operation effectively and automatically inform a repair unit supervisor in case of anomalies in electric motor operation.

Keywords: color coating line, anomalies prediction, machine learning, random forest, decision tree.

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