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Predictive analytics in quality assurance for assembly processes: lessons learned from a case study at an industry 4.0 demonstration cell

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Abstract

Quality assurance (QA) is an important task in manufacturing to assess whether products meet their specifications. However, QA might be expensive, time-consuming, incomplete, or delayed. This paper presents a solution for predictive analytics in QA based on machine sensor values during production while employing machine-learning models based on logistic regression in a controlled environment. Furthermore, we present lessons learned while implementing this model, which helps to reduce complexity in further industrial applications. The papers outcome proves that the developed model was able to predict the product quality, as well as to identify the correlation between machine-status and faulty product occurrence.

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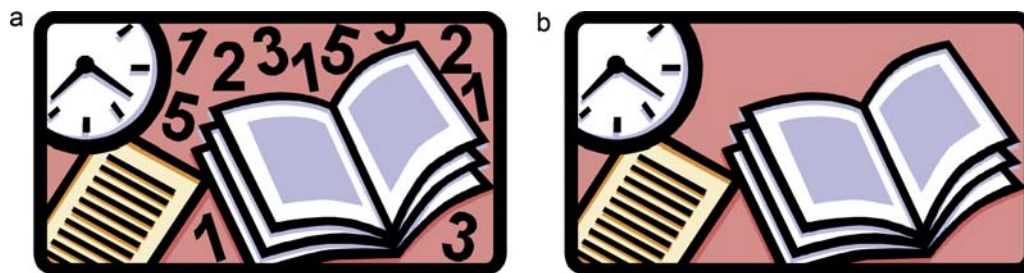


Fig. 1. (a) first picture; (b) second picture.

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$$\rho = \frac{\vec{E}}{J_c(T = \text{const.}) \cdot \left(P \cdot \left(\frac{\vec{E}}{E_c} \right)^m + (1 - P) \right)} \quad (1)$$

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References

- [1] Clark, T., Woodley, R., De Halas, D., 1962. Gas-Graphite Systems, in “*Nuclear Graphite*”. In: Nightingale, R. (Ed.). Academic Press, New York, pp. 387.
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