POLITECHNIKA ŚLĄSKA

WYDZIAŁ MECHANICZNY TECHNOLOGICZNY

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Opracowanie metody identyfikacji przyczyn zmienności wysokowydajnych ciągłych procesów produkcyjnych

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Gliwice 2021

Abstract

The results presented in the doctoral dissertation are the result of research conducted in the "Implementation Doctorate" project, focused on a technological problem indicated by the company / industrial partner, being the recipient of the results of the doctoral dissertation, which provides control and process systems for industries in the pulp and paper, energy and chemical industries. The identified problem concerned the lack of effective computer methods and tools for predicting failures occurring in automated high-performance paper production processes. The solution developed as part of the work is a computer implementation of the developed method of identifying symptoms and searching for the causes of disturbances in high-performance continuous production processes, based on the analysis of production data, using an algorithm derived from the area of exploratory data analysis and data mining, along with an original approach, which is a way of proceeding in the process parameterization of the algorithms included in its composition. It enables early and reliable detection of symptoms of impending disturbances in the papermaking process. System of Detecting Disturbances in Paper (SODDIP), automatically searches the set of production data, analyzes it and provides information about irregularities in the headbox area of the wet-end part of the paper machine. The system has been prepared for implementation in production conditions, where in addition to searching for anomalies based on production data, it provides information that enables the analysis of the cause of their occurrence. The developed method complements the tools for controlling the current production and determining basic performance data, which is the added value of the developed solution.