عنوان مقاله:

A Transformer-based Approach for aAnomaly Detection in Wire eElectrical Discharge

محل انتشار:

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خلاصه مقاله:

Although theoretical models of manufacturing processes are useful for understanding physical events, it can be challenging to apply them in real-world industrial settings. When huge data are accessible, artificial intelligence approaches in the context of Industry ۴.۰ can offer effective answers to real production challenges. Deep learning is increasingly being used in the realm of artificial intelligence to address a variety of issues relating to information and communication technology, but it is still limited or perhaps nonexistent in the industrial sector. In this study, wire electrical discharge machining—a sophisticated machining technique primarily used for computer hardware components—is applied to effectively forecast unforeseen occurrences. By identifying hidden patterns in process signals, anomalies, such as changes in the thickness of a machined item, may be efficiently anticipated before they occur. In this study, a model for anomaly detection in the sequence of thickness change in the machined component based on transformers is suggested. Our method is able to achieve ۹۴.۳۲ % and ۹۴.۱۶ % accuracy in Z ۱۳۵ and Z ۱۵ datasets, respectively. Also, it forecasts the abnormalities inside the sequence ۱.۱ seconds in advance, according to our tests on a dataset that has been introduced.

کلمات کلیدی:

transformers, wire electrical discharge, Anomaly detection

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