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Energy Anomaly Detection in Industrial Applications with Long Short-term Memory-based Autoencoders

Can Kaymakci^{*,a,b}, Simon Wenninger^c, Alexander Sauer^{a,b} *

^aFraunhofer Institute for Manufacturing Engineering and Automation IPA, Nobelstrasse 12, 70569 Stuttgart, Germany

^bInstitute for Energy Efficiency in Production, University of Stuttgart

^cFIM Research Center, University of Applied Sciences Augsburg, Project Group Business & Information Systems Engineering of the Fraunhofer FIT, Universitätsstr. 12, Augsburg 86159, Germany

* Corresponding author. Tel.: +49 711 970-3691; fax: +49 711 970-3606. E-mail address: can.kaymakci@ipa.fraunhofer.de

Abstract

With the goal of reducing energy costs, carbon emissions, and achieving cleaner production, manufacturing companies aim to reduce their energy consumption. In manufacturing companies, a considerable amount of energy is wasted due to plant-, process- and human-related faults. Tools and methods for detecting anomalies are widely used for fraud detection in finance or intrusion detection in cybersecurity. When it comes to anomaly detection of malicious energy consumption, the residential building sector is leading. Industrial applications are not being addressed by now. In this paper, an end-to-end solution of an anomaly detection system is presented that uses the concept of a Long Short-term Memory based Autoencoder (LSTM-AE) as an unsupervised learning model that detects anomalies without labeling the data beforehand.

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