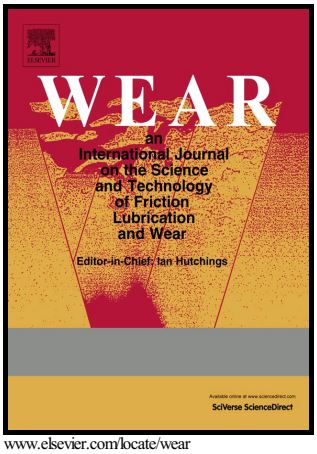
Classification of impact damage on a rubber-textile conveyor belt using Naïve-Bayes methodology

Miriam Andrejiova, Anna Grincova



www.elsevier.com/locate/wear

PII: S0043-1648(18)30655-0
DOI: https://doi.org/10.1016/j.wear.2018.08.001
Reference: WEA102476

To appear in: *Wear*

Received date: 31 May 2018
Revised date: 2 August 2018
Accepted date: 2 August 2018

Cite this article as: Miriam Andrejiova and Anna Grincova, Classification of impact damage on a rubber-textile conveyor belt using Naïve-Bayes methodology, *Wear,* https://doi.org/10.1016/j.wear.2018.08.001

Classification of impact damage on a rubber-textile conveyor belt using Naïve-Bayes methodology

Miriam Andrejiova[a], Anna Grincova[b]

[a]Faculty of Mechanical Engineering, Technical University of Kosice, Letna 9, 042 00 Kosice, Slovak Republic

[b]Faculty of Electrical Engineering and Informatics, Technical University of Kosice, Letna 9, 042 00 Kosice, Slovak Republic

Abstract

The selection of the proper materials is an integral component of most technological processes, and the selection of durable conveyor belt materials is a principal example. The overall quality of a conveyor belt and its service life under impact loads are very important factors. Accordingly, the purpose of the present work is to classify the types of impact damage that occur in rubber-textile conveyor belts. Under laboratory conditions, different types of conveyor belts (unused, used, used with a subsequent top cover layer renovation) were tested. They were subjected to variables such as the drop height and the type of impacting material. The severity of the conveyor belt damage was categorised using four degrees. An examination of the effects of the selected factors on the degree of damage was carried out using probability theory. In particular, an evaluation of the experimental test data and predictive modelling was conducted using the Naïve Bayes Classifier.

Keywords: rubber-textile conveyor belt, damage, classification model, Naïve Bayes Classifier

1. Introduction

A belt conveyor is one of the most frequently used conveyor types due to its high transport efficiency and speed, long transport distances, low energy consumption, operating safety, and simple operations and maintenance [1, 2]. An analysis of belt conveyor failures is dealt with by [3].

An active component in the transferring of materials is a conveyor belt. The belt has to provide a smooth transportation of the materials between the loading site and the unloading site. Any