

## **TITLE OF DIPLOMA THESIS**

Scientometric analysis and machine learning techniques for estimating financial indexes of construction equipment

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## **ABSTRACT**

Nowadays, residual value of construction equipment, the factors that determine it and the way in which it is estimated, are presenting an increased interest among construction companies. The importance of the residual value lies not only on the extent to which it affects the overall management policy of an owner company, but also on the choice of the overall implemented replacement strategy. In this thesis, some basic concepts of artificial intelligence (AI) are examined initially. AI is a branch of information technology that deals with the design and implementation of computer systems that mimic elements of human behavior and imply even an elementary intelligence such as: learning, adaptability, drawing conclusions, contextual understanding, problem solving. In addition, a bibliographic research was conducted, concerning recent years publications, covering a common thematic cycle of construction equipment, residual value and machine learning. This research is conducted with VOSViewer, a bibliometric imaging software that uses advanced machine learning techniques. Through the analysis the factors that play an integral role to the formation of residual value are presented and discussed. The development of a machine learning model using Rapid Miner, a special machine learning software, which estimates and predicts the residual values of Caterpillar's crawled excavators, crawled dozers and wheeled loaders was conducted. The model was based on an extensive data that was collected from an official website with detailed information on construction equipment purchases and sales. Information about the present residual value, the residual value change rate, the equipment type, the year of construction, the country's interest rate during the year of purchase and more was analyzed.

## **KEYWORDS**

Residual value, construction equipment, equipment management, machine learning, bibliometric analysis