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## Automated Mechanical Workshop Tools Management System

W.T.J. Soysa <sup>a\*</sup>, M.P.U. Isuranga <sup>a</sup>

*Department of Engineering Technology, Faculty of Technology, University of Ruhuna, Kamburupitiya, Matara, Sri Lanka*

\*Corresponding author: *thilina\_2016044@fot.ruh.ac.lk*

### ABSTRACT

In recent years, due to the advancement of technology, there have been several types of tools introduced to workshops to make duties easier. But improper use of workshop tools can lead to many problems for both labour and tools. As a result, adequate tool management is required. Conventional tool management methods have several drawbacks, including labour reluctance to put the tools back in the correct position on the tool board or toolbox, and no proper way to trace the tools' availability. Labour may encounter issues when tools are not in the proper location and have difficulties locating the tool. It leads to requiring additional time and effort to locate the instrument when it is needed again. Due to lower variable costs associated with tool retrieval, tool return, and tool inventory management, it outperforms the manual process in terms of accuracy and efficiency. It also frees up human labour to focus on their primary responsibilities. Available automated tool management storage devices require the tool to be selected manually when replacing and tool retrieval. This study proposed an automated tool management system capable of automatically detecting, replacing, and recovering tools with less time and effort than human labour and controlled by a computerized system. The Brute-Force Matchers technique was used to accurately detect the tools using image feature matching. This algorithm achieved promising results when matching different tools with the saved image descriptors. A tool feed to the system was identified to perform automatic replacement, and a moveable tool bed was used to store the tools in a specific location. The system takes about 45 seconds to deliver the selected tool and one second to identify a tool. The proposed system provides a cost-effective and efficient solution to the tool management crisis.

**Keywords:** *computerized system, feature detecting, tools identifying, tools repositioning, tools retrieving*