Identifying Sewing Machine Types According to the Stitches Using Machine Learning

K.U. Wickramarathne* and C.Y. Gamage

Department of Information and Communication Technology, Faculty of Technology, University of Ruhuna

**kasuniupeksha422@gmail.com*

Abstract

Identifying sewing machine types based on stitches plays a crucial role in ensuring the quality of garment production. For buying companies, to order garment products, it's a requirement to check the quality of the product. Deciding the specific quality of the product manually is a difficult task. Therefore, in the textile industry, there is a necessity for an automated system that can easily identify and verify whether the sewing machine type is correct or not, so the orders can be accepted or rejected easily. The model proposed in this paper helps to detect the type of sewing machine based on the stitches on clothing. This research is significant because it improves the quality control of garment production and ensures that buying companies can verify that orders meet the required standards. With the proposed model not only large-scale garments but small-scale garments can also identify the sewing machine types and solve their day-to-day problems effectively. The main objectives of the research are to create a data set of stitch images, segment the stitch patterns from images, extract features from the segmented images, and train the model to identify the sewing machine types. In this proposed methodology, the Keras Sequential Model has been employed to explore the automated identification of various sewing machine types through their unique stitch patterns. The research methodology involved enhancing image quality by reducing noise, selecting appropriate tools for system modeling, training the model with machine learning algorithms, and comparing the results with manual checks. The model achieved an accuracy of 82.80%. Identifying the defects in fabric during the manufacturing process and automatically categorizing or matching textile colors to improve dyeing and manufacturing processes are significant impacts that can be achieved in the future using the Keras Sequential Model.

Keywords: *Keras sequential model, Stitch pattern recognition, XGBoostVision model*