
An automated defect identification and marking system for sail manufacturing industry using image processing technique

Sewwandi R.U., Chamari R.M.L. and Liyanage D.N.*

Department of Engineering Technology, University of Ruhuna, Matara, Sri Lanka.

Quality control is an essential and inevitable part of the production process. Defect detection in the sail-making tape is one of the most critical quality control measures in sail manufacturing. This study is based on a sail-making company in Sri Lanka which uses a manual defect detection method. It is mainly based on a visually inspecting work done by the machine operator while controlling the whole sail-making tape producing process. A large amount of tape is wasted this way, and it is the main drawback of this system. This study explored the development of an automated defect identification and marking system which detects the spots (defects) in the white sail making tape. By automatically marking the correct spot, tape wastage is reduced. This automated defect identification and marking system consists of a web camera that captures the images to identify the small spots in sailmaking tapes, and defect marking pens which automatically mark the defects on the correct region. When the web camera detects a spot (defect) in sail-making tape, the marking pen receives an actuation signal through the raspberry pi module. The programme runs using a python script. Performance of the defect identification and marking machine was evaluated using a substitute paper marked with similar defects. These defects were artificially made throughout the paper covering right, left and center areas. All defects were detected and marked with a success rate of over 90%. The results show a considerable improvement in terms of precision and speed when compared to the existing system. Proposed system achieved the main objective of minimizing tape wastage caused by current defect and marking method.

Keywords: Sail-making tape, Web camera, Black spot, Raspberry pi, Image processing

*Corresponding author: dulani@etec.ruh.ac.lk