

## **ABSTRACT**

According to the Ministry of Industry, textile industry and textile product in Indonesia have an increases around 5.4% in every year. One of textile industries that still exist in Indonesia is CV. MAEMUNAH MAJALAYA, which produce woven fabrics as their core product. The production demand in that company is very high and always have increases in production volume which around 20000 meters of fabrics demand in every week. However, the unbalance production volume with the inspection capacity always occur in each week. The capacity for inspecting the fabrics is only 30 meters per hours with four inspection station available or it is around 5000 meters per week, while the demand is four times higher than the inspection capacity. Therefore, a massive bottle neck is occurred which around 30000 meters in five weeks, then it can cause the delay for product shipping process. That is being the main issue in this study which occur because the inspection process is still conducted manually by using human vision.

In order to solve the main issue, automated system through image processing is implemented to optimize the inspection capacity. The system will support the inspection activity for recognizing the mostly appeared defects which is broken and unwoven yarn. In addition, the image processing system requires design of experiments (DOE) to identify what the system needs. Taguchi approach is one of DOE method that utilize different combination of factors and levels through  $L_{27}(3^{13})$  Orthogonal Array. The chosen optimum factors and levels combination is used for supporting the image processing system to recognize the unwoven and broken yarn defects that mostly occur in the inspection process. Those levels and factors are 463 lux of light intensity, 20 cm of camera distance, 8 MP of camera resolution, 0.2 of Threshold, and 47 of Grayscale.

**Keywords:** Design of Experiment, Taguchi Approach, Image Processing System, Woven Fabrics, Fabrics Inspection, Orthogonal Arrays.