

ABSTRACT

Development of a Vision Technology to Monitor Anomalies in Sheet Materials.

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The problem of monitoring sheet material manufacturing processes such as plastic film, paper web, aluminum foil, sheet metal and flat glass for anomalies is considered in this research. The objective of this research is to develop a machine vision technology to monitor sheet material manufacturing processes where 100% inspection is not feasible or cost effective.

A model to represent the anomalies in sheet materials is developed. The total defective area in sheet materials is modeled as a compound Poisson process and a procedure to monitor it is developed based on the normal approximation. Different control charts to monitor the rate of anomalies are compared. A scheme to monitor the location of anomalies in sheet materials is developed based on the most powerful test statistics against the alternatives considered. This scheme is compared with that of using control charts based on omnibus statistics.