ABSTRACT

Automated visual inspection systems are the most versatile non-contact inspection systems. They are fast, compact and remarkably accurate, thereby making 100% on-line inspection is possible in modern manufacturing.

In this project an approach for geometrical inspection of components that are randomly positioned within camera viewing scene is introduced.

The image processing techniques that are concerned with image segmentation, filtering, edge detection and contour tracing are discussed and implemented by developing proper algorithms. Experimental results were achieved and discussed.

Shapes of objects were coded using polar coding to match these shapes properly by applying cross-correlation technique. This was implemented depending on the values of minimum absolute mean error.

Some statistical characteristics were applied for object shape recognition and identification. These characteristics include maximum error, mean error, standard deviation and error accumulation. The results of applying these values were analyzed and discussed taking into consideration the capability of using this system for inspection activities.

Finally a brief discussion of the obtained results and some conclusions and suggestion for future work are presented.