Abstract

Automated Visual Inspection techniques in use today suffer from lack of flexibility in object positioning, and the positioning is highly constrained. This thesis attempts to overcome this barrier by making a robust estimation of object positions from a set of measurements. Robustness with respect to noise and accuracy are the most important requirements for estimating object positions in flexible AVI systems. The thesis has explored two major branches of soft computing, namely Artificial Neural Networks and Genetic Algorithm. ANN is adaptable through training, whereas GA explores the search space mimicking the theory of biological evolution. The results clearly demonstrate that in terms of robustness, the soft computing techniques outperform the classical ones. A novel approach to pose estimation from unknown correspondences has been developed which integrates the process of matching with pose-estimation without any *a priori* matching assumption.

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