نویسندگان:

mahmoud jeddi - *university complex of materials and manufacturing technology,Malek Ashtar university of technology,Tehran,Iran*

Ahmad Khoogar - *Department of Mechanical Engineering Maleke Ashtar University of Technology*

Ali Mehdipoor Omrani - *Departement Of Mechanical Engineering, Malek Ashtar university of Technology, Lavizan, Iran*

خلاصه مقاله:

A robot detects its surroundings through camera information and its response requires a high-speed image process. Due to the increasing application of vision systems, various algorithms have been developed to increase speed of image processing. This paper proposes a double density Discrete Wavelet-based Neural Network to enhance feature extraction and classification of parts in each picture. The Discrete Wavelet-based Neural Network combines multi-scale analysis ability of the wavelet transform and the classification capability of the artificial neural network by setting the wavelet function as the transfer function of the neural network. The automatic assembly process needs to capture the image in an online process in order to recognize the parts in the image and identify the location and orientation of the parts. In this part, the two dimensional double density discrete wavelet transform have been applied to compress and remove noise from the captured Image. By applying a value for the threshold, the coefficients of the wavelet transform function are obtained using these coefficients and the characteristics of the wavelet coefficients are calculated. Subsequently, a multilayer perceptron is trained using these extracted features of the images. To find the best vector characteristics, various combinations of extracted properties have been investigated. This method has succeeded in object detection and results show that the Neural Networks and the training algorithm based on the wavelet transform function have exquisite accuracy in classification. Thus, the developed method is considered effective as compared to other state-of-the-art techniques.

کلمات کلیدی:

Feature extraction, Image compression, Neural network, Object Detection, Wavelet Transform