

## The Framework of Image Recognition Based on Modified Freeman Chain Code

### Abstract

Image recognition of line drawing involves feature extraction and feature comparison; works on the extraction required the representation of the image to be compared and analysed. Combining these two requirements, a framework that implements a new extraction algorithm of a chain code representation is presented. In addition, new corner detection is presented as pre-processing to the line drawing input in order to derive the chain code. This paper presents a new framework that consists of five steps namely pre-processing and image processing, new corner detection algorithm, chain code generator, feature extraction algorithm, and recognition process. Heuristic approach that is applied in the corner detection algorithm accepts thinned binary image as input and produces a modified thinned binary image containing J characters to represent corners in the image. Using the modified thinned binary image, a new chain code scheme that is based on Freeman chain code is proposed and an algorithm is developed to generate a single chain code series that is representing the line drawing input. The feature extraction algorithm is then extracts the three pre-defined features of the chain code for recognition purpose. The features are corner properties, distance between corners, and angle from a corner to the connected corner. The explanation of steps in the framework is supported with two line drawings. The results show that the framework successfully recognizes line drawing into five categories namely not similar line drawing, and four other categories that are similar but with attributes of rotation angle and scaling ratio.