

ABSTRACT

This thesis describes a serial processing system to recognize line patterns by digital technique, which deals with a flexible, potent and newly developed scanning device, capable of extracting relevant features irrespective of variations in size, location and the angle at which the patterns are presented to flying spot scanner.

The line patterns from paper are transferred into a 1620 digital computer and stored on a matrix of suitable size. The presence of the pattern on the storage matrix is designated by 'ones' and the absence by 'zeros'. A programmed prescan examines the storage matrix elements row-wise and locates the presence of the pattern.

A special search scan is initialised at the pattern point located by the prescan and programmed to follow the stored patterns. Step-wise movement of the search scan to facilitate the routing decisions is achieved by adding the movement vector to the address of the scan centre. The scanning process transforms the two dimensional line patterns into one dimensional groups of lines which may, or may not, coincide with the natural divisions of patterns.

Relevant features such as, line segments, bends with their angles, junctions with their nature and closure if any are detected during the following process. The recognition is accomplished by comparing the detected features

with the computer-generated pattern parameters and the computer prints out the name of pattern on best fit basis.

Fifteen geometrical line shapes in various sizes and orientations, a fairly complicated alphabet K and a fairly complicated numeral 4 were considered for recognition.

The technique was first tested by manual following and later by simulation on the 1620 digital computer and, proved to be highly successful with line patterns in two dimensional space.

1.1	Introduction	19
1.2	Character recognition techniques	21
1.3	Pattern recognition techniques	22
1.4	Character recognition techniques	22
1.5	Character recognition techniques	24
1.6	Character recognition techniques	26
1.7	Character recognition techniques	26
1.8	Character recognition techniques	28
1.9	Character recognition techniques	29
1.10	Character recognition techniques	30
1.11	Character recognition techniques	31
1.12	Character recognition techniques	32
1.13	Character recognition techniques	33
1.14	Character recognition techniques	34