

CHARACTER RECOGNITION USING A LOG-AUTOCORRELATION FUNCTION

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ABSTRACT

Chromosome analysis is complicated in that chromosomes of the same class appear in different shapes. We consider shape description in terms of conic sections. An individual chromosome is defined as a non-negative function f on the real plane, subject to certain constraints on position, size, orientation, etc. A conic section is represented by a quadratic form $Q(x,y) - 0$, and a best conic for f is one for which

$$\int \int f(x,y) |Q(x,y)|^2 dx dy$$

is minimum. The problem may be formulated as an eigenvalue problem of order six, the vector corresponding to the smallest root defining the best conic.

The chromosome shape is first described by five basic parameters; with these different chromosome shapes may be distinguished. Next a conic skeleton is defined which reflects the general shape of the denser parts of the chromosome. The chromosome may then be analysed with the aid of the skeleton, in particular the skeleton suggests transformations which may profitably be carried out on the pattern.