

On modifications of the method of constructing a linear discriminant function based on the Peterson-Mattson procedure

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Abstract

The paper considers a number of new modifications of the well-known method for constructing a linear discriminant function that minimizes the probability of misclassification and is based on the Peterson-Mattson procedure. The modifications are related to the expansion of its scope to include a number of typical situations that are not solved by the known method. In particular, this applies to the situation of developing a classifier according to the Neumann-Pearson criterion or other criteria that simultaneously minimize the probability of errors, and to the situation of coinciding average attributes in classes. For the latter situation, it is shown that the problem is reduced to finding an orthogonal vector space to the vectors being the rows of the matrix obtained as a weighted sum of covariance matrices of attributes in classes.

Keywords: discriminant function, Peterson-Mattson procedure, Neumann-Pearson criterion, orthogonal vector, matrix.

Citation: Myasnikov VV. On modifications of the method of constructing a linear discriminant function based on the Peterson-Mattson procedure. Computer Optics 2004; 26: 74-80.

[Access full text \(in Russian\)](#)

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