Authentification of Person with Dynamically Entered Signature Using of Normal Ortogonal Discrete Transformation

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Abstract – **In this paper the task of authentification of person with dynamically entered signature using normal transformation is solved. High reliability and sensitivity of this method are shown. The results can be used for creation information defence systems.**

Keywords – **Authentification, normal transformation, the coefficient of transforms**.

I. INTRODUCTION

Authentification of person who has an access to the certain apartments and materials of the computer systems is an actual task. Such authentification can be conducted with classification of dynamically entered signature, decomposed in time on the coordinates of x(t) and y(t) using of normal ortogonal discrete transformation.

II. DESCRIPTION OF RESULTS

Normal transformation allows to estimate convergence or divergence between time and amplitude rationed expectation of expansion of $m_x(t)$, $m_y(t)$ with the coefficient of transforms from Eq.1:

$$k_{\partial\partial} = \sqrt{\sum_{n=2}^{N} I_n^{\,2}} \Big/ \sqrt{I_1^{\,2}} \qquad (1)$$

I_n are transforms of transformation, I_1 is a transform which has the same form with the expectation $m_x(t)$ or $m_y(t)$. Two classifier operators of normal transformations $\overline{\overline{W}}_{Nx}$ and $\overline{\overline{W}}_{Ny}$ and of expansion of certain person dynamic signature are used for increasing of reliability of classification.

The expectation M_x, M_y and bands of realization $X_{\hat{i}i}$, $Y_{\hat{i}i}$ are represented from the got results accordingly to Fig.1a,b.

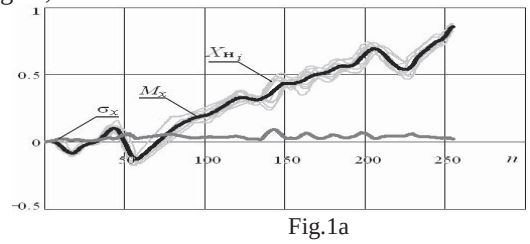

Fig.1a

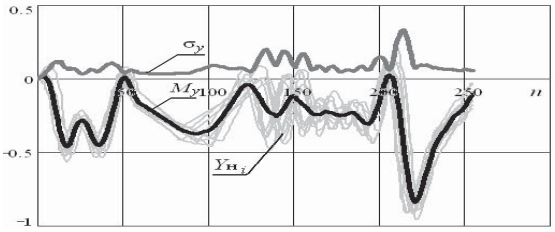

Fig.1b

The results of work of classifiers M_x, M_y (coefficients of transforms) for person, under whose signature classifier was built (first line) and for other person are shown in a table 1 and 2.

Table.1.

i	1	2	3	4	5	6	7	8	9	10
$k_{mp\ X1i}$	0.058	0.061	0.057	0.086	0.098	0.071	0.084	0.082	0.084	0.081
$k_{mp\ X2i}$	0.520	0.499	0.530	0.575	0.593	0.575	0.569	0.653	0.554	0.536

Table.2.

i	1	2	3	4	5	6	7	8	9	10
$k_{mp\ Y1i}$	0.271	0.206	0.306	0.314	0.414	0.231	0.224	0.394	0.238	0.329
$k_{mp\ Y2i}$	0.939	0.854	0.807	0.879	0.874	0.769	0.835	0.774	0.738	0.781

High reliability and sensitivity of classifiers by the expectation $m_x(t)$, $m_y(t)$ follows from the results obtained. Analogical classifiers were built for 30 persons after bands in 10-20 signatures. There was reliable classification on the dynamically entered signatures in all cases. From all examinations only in two cases there was wrong classification which gave a right result at the repeated signature.

III. CONCLUSION

Got results testify to high reliability and efficiency of authentification of person with dynamically entered signature using of normal ortogonal discrete transformation.

REFERENCES

Рибін О.І., Ніжебецька Ю.Х. Нормальне дискретне ортогональне перетворення // Вісник НТУУ "КПІ". Серія Радіотехніка. Радіоапаратуробудування.– 2008.– Вип. 37.– с.8– 15

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