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DEVELOP A METHOD FOR CONTROL THE IDENTITY OF REPRODUCTION PRINT

OCTOBER 19-20, 2010 MOSCOW, RUSSIA

AIMS OF WORK

 The main scientific objective of the research is to develop an objective deviceindependent technique for assessing the quality of the printing image and establishing its conformity to the original.

MAIN PROBLEMS TO SOLVE

- To perform analysis of the technological and technical characteristics of controlled object (print).
- 2. To define the parameter which will determine the way of controlling the identity of prints.
- O 3. To perform analysis of the existing ways of segmentation of digital images. To develop an algorithm for segmentation of the analyzed image in areas with equal brightness-chromatic characteristics.

MAIN PROBLEMS TO SOLVE

- 4. To develop algorithm of quantitative analysis of properties of the isolated segments of the image. To run the calculation of the segmented sections area with equal brightness-chromatic characteristics.
- 5. To define zones of maximum permissible deviations from the absolute value for the investigated parameter (segmented sections area value).
- 6. When the listed problems are solved, it is necessary to define the form of comparison of investigated parameters to prepare the conclusion about the conformity of quality of the analyzed image to the reference sample.

HYPOTHESIS RESEARCH



HYPOTHESIS RESEARCH



Way of definition of intervals of admissible values for values of analyzed indicators.

For definition of the top border of the admission of the reference image we increase value in color system CIELab for channel L by 1,5 units, and value of channels an and b on 1 unit. For definition of the bottom border of the admission of the reference image we for channel L reduce value by 1,5 units, and value for channels an and b we reduce by 1 unit. As a result, we receive two images, with as much as possible and is minimum admissible (considering that ΔE should be no more than 4 units) values of brightness-chromatic characteristics.







INFLUENCE OF CHANGE BRIGHTNESS IMAGE CHARACTERISTICS FOR WORK OF THE OFFERED METHOD



Изображение оригинала

Распределене для L-канала(оттиск-красная линия, зона допуска-зеленая) Распределене для а-канала(оттиск-красная линия, зона допуска-зеленая)

Распределене для b-канала(оттиск-красная линия, зона допуска-зеленая)







Influence of change colorimetric characteristics on the printing image for work of the offered technique

Meaning of zone optical density for investigated images.

optical density inks D	Image-etalon	Image 1	Image 2	Image 3
Cyan	1.4-1.46	1.3-1.46	1.28-1.42	1.29-1.31
Magenta	1.42-1.5	1.41-1.44	1.53-1.58	1.21-1.25
Yellow	1.31-1.32	0.78-0.82	1.39-1.43	1.02-1.07
Black	2.6-2.67	1.35-1.48	2.28-2.33	2.26-2.38



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Influence of change colorimetric characteristics on the printing image for work of the offered technique











Influence of change colorimetric characteristics on the printing image for work of the offered technique





Распределене для L-канала(отиск-красная линия, зона допуска-зеленая) Распределене для а-канала(отиск-красная линия, зона допуска-зеленая) Распределене для b-канала(отиск-красная линия, зона допуска-зеленая)



Influence of change colorimetric characteristics on the printing image for work of the offered technique





Распределене триля L-канала(оттиск-красная линия, зона допуска-зеленая]

Распределене, для а-канала(оттиск-красная линия, зона допуска-зеленая)

Оттиск 301 Орисквал Франция Сорисквал Распределене для b-канала(оттиск-красная линия, зона допуска-зеленая)



Influence of change of a lineature of the image on work of the offered method



Print-etalon – 175 lpi, analyzed print – 133 lpi.

Распределене для L-канала(оттиск-красная линия, зона допуска-зелен Распределене для а-канала(оттиск-красная линия, зона допуска-зеленая) Распределене распределене распределене распределение для b-канала(оттиск-красная линия, зона допуска-зеленая)



Influence of change of a lineature of the image on work of the offered method





L-канал

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пиксел

Influence of change of the form of raster points on the image for work of the offered method

Print-etalon - 133 lpi (a round point), an analyzed print - 133 lpi (a raster point in the form of a diamond).



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Оттиск

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Оригинал

SF150133.tif

Оттиск

Оригинал

b-график

а-графия

L-madvis

b-канал

Influence of change of the form of raster points on the image for work of the offered method

Print-etalon - 133 lpi (a round point), an analyzed print - 133 lpi (a raster point in the form of an ellipse).



Оттиск

SF150133e.tif

SF150133.tif

Оттиск

Орилинал

b-график

а-график

L-график

b-канал

а-канал

L-канал

Influence of change of a dots gained on the image for work of the offered method









Influence of change of a dots gained on the image for work of the offered method



Распределение для L-канала(оттиск-красная линия, зона допуска-зеленая, 10000 Оттиск 4.jpg Орипинал 8000 1.jpg 6000 4000 Оттиск Орипинал 2000 b-график а-график L-график 20 15 25 **b**-канал Уровень яркости а-канал L-канал

Распределение для а-канала(оттиск-красная линия, зона допуска-зеленая,







Распределение для b-канала(оттиск-красная линия, зона допуска-зеленая,

CONCLUSION

- The control of the image by means of the values defined there by is more in line with the visual perception process than the control of quantitative analysis of brightness or color coordinates on separate image elements
- The software product that performs complex data processing and visualization of research results, which are essential to draw the conclusion about the quality of the printing image, has been developed.
- The experimental research of the influence of the basic technology factors on the accuracy of the estimation of the statistical parameters characterizing the quality of duplicating process has been performed.

THANK YOU FOR ATTENTION

October 19-20, 2010 Moscow, Russia





приведена 3-D модель монохромного изображения печатного оттиска, сегментированное с помощью порогового преобразования с множественным порогом М1 (10, 20, 30, 50, 70, 90,95)



а

L





b