In search of independence. Methods of colour chart analysis

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Introduction

During a seminar organised at the Museum of King John III's Palace at Wilanów on 17–18 November 2022, entitled 'Digitalizacja w muzeach – forum dyskusyjne. O problemach związanych z tworzeniem cyfrowej dokumentacji' [Digitization in museums – a discussion forum. On the issues related to the development of digital documentation], some of the statements in the debate concerned the need to avoid reliance on the deltae.picturae.com/ platform, while offering smaller institutions access to other software solutions and colour charts available at lower prices compared to products by Image Science Associates.[1] This paper is an attempt to outline the alternatives to the delt.ae platform, as well as to describe the spatial data that can be obtained by analysing Calibrite's ColorChecker colour charts.[2]

Delt.ae

The delt.ae platform was developed within the framework of an EU-funded project and launched in 2012 in order to enable numerous institutions to easily and cheaply test the quality of digital copies they obtained. However, the development of the platform has been stalled for several years now; as a result, it is missing the X-Rite/Calibrite colour charts. There were no updates concerning these popular colour charts, even though the changes to the colours were introduced in November 2014.[3] What is more, the delt.ae website is run by Picturae – a private company, which may shut it down at any time.[4] Picturae is a Dutch company, which specialises in digitisation services.[5]

Image Science Associates

The colour charts manufactured by the United States-based Image Science Associates (ISA) are widely regarded as the most precise and – unlike Calibrite products – they undergo very stringent quality checks. What is more, thanks to the integration of an entire spatial test suite on a single colour chart, they enable comprehensive analysis of digital copies. In addition to

1 Other commercial alternatives include products by the German company Image Engineering, including UTT colour charts and iQ-Analyzer software; however, they are outside the scope of this paper, which focuses on free solutions.

2 X-Rite (before 2021) and Gretag-Macbeth (before 2006); the company's basic 20-field colour chart was first developed nearly 50 years ago.

3 babelcolor.com/colorchecker.htm (accessed 19 April 2023).

4 This prediction turned out to be prophetic. On 31 December 2023, after the paper was submitted to the editorial team, the delt.ae platform maintained by Picturae and its servers were shut down (editor's note).

5 picturae.com/en/who-we-are/about-us (accessed 19 April 2023).

verifying colour fidelity, they enable checking lighting intensity and quality of detail reproduction. These solutions may, however, be cost-prohibitive for smaller institutions, given in particular the need of purchasing replacement colour charts on a regular basis after a few years of use.[6]

The paper outlines three other available software solutions, as well as discusses the way of carrying out spatial tests based on the conventional 24-field colour charts.

The scope of the paper is also limited to the FADGI and Metamorfoze guidelines, which were propagated by the delt.ae platform. The ISO 19264 standard, which is gaining popularity in European museums, is a paid document;[7] this precluded its inclusion in this paper, which focuses on free solutions.

OpenDICE

The first presented solution is the OpenDICE software[8] developed by the Library of Congress in the United States.[9] It is a measurement tool that enables cultural institutions to check for compliance with the FADGI[10] guidelines concerning the digitisation of archive materials. OpenDICE remains the most comprehensive and fully-featured solution among the presented software suites.

OpenDICE has been developed as an alternative to DICE, a tool developed by United States-based ISA as part of a solution called GoldenThread, which is used for measuring and analysing compliance with FADGI guidelines.[11] The open-source solution is available under the BSD licence,[12] which enables users to download and use it free of

6 The total cost of the basic set purchased directly from the manufacturer in 2024 was 1535 USD *(Device Level Target* and *Object Level Targets*); www.imagescienceassociates.com/targets.html (accessed 28 May 2024).

7 194 CHF. In addition to the base price, due to the fact that the document references other standards, its comprehensive implementation requires spending several times more; www.iso.org/obp/ui/en/#iso:std:iso:19264:-1:ed-1:v1:en (accessed 28 May 2024).

8 www.digitizationguidelines.gov/guidelines/digitize-OpenDice.html (accessed 19 April 2023).

9 www.digitizationguidelines.gov/guidelines/OpenDICE/OpenDICE_manual_v2.6.docx (accessed 19 April 2023).

10 The FADGI (Federal Agencies Digital Guidelines Initiative) guidelines are a system of recommendations which have been developed in the United States since 2007. Their objective is to present a universally recognised framework process for creating photographic documentation. The guidelines concern flat objects. The latest (third) edition of the guidelines was released in May 2023; www.digitizationguidelines.gov/guidelines/digitize-technical.html (accessed 28 May 2024).

11 The Golden Thread solution remains unpopular in Poland; one of the reasons for this is the price of the software. In 2024, a licence cost 3300 USD; www.imagescienceassociates.com/goldenthread.html (accessed 28 May 2024).

12 The Berkeley Software Distribution (BSD) is a type of licence used by software developers who want to ensure that the results of their work are available to numerous users (editor's note).

charge. Additionally, it can be modified and developed further by the user community.

OpenDICE can be integrated with other digitisation management tools and systems, enabling users to manage the digitisation process more easily and efficiently. The command-line interface variant of the tool enables batch processing and mass analysis of digital copies.[13]

The results obtained as a result of using the OpenDICE software have been tested and compared with those obtained with the commercial DICE solution and their reliability was validated. The result of the analysis depends on the quality of the input data. The colour charts need to be in good condition, and they should be measured in a way that ensures high quality that can be used as the basis for detailed comparison.

OpenDICE supports a number of colour chart types, including ColorChecker SG, GoldenThread Device Level (DICE), GoldenThread Object Level Small (ObjectDICE Small), FADGI 19264, IT8.7/1 and 2, UTT. The lack of support for the ColorChecker Classic 24-field colour charts must be noted.[14]

Each test can be conducted with a specific target FADGI level: 4 stars (default), 3, 2 or 1. Before starting the test, the user also needs to specify which FADGI profile will be used as the source of parameters for the test – this affects the differences in the cut-off values for each parameter.[15] As of version 3.x, the software supports the 2023 edition of the FADGI guidelines. Additionally, the user can change the expected values in the relevant configuration files; this includes ΔE, white balance and sharpening.

Selecting a colour chart is tantamount to selecting the relevant configuration file for the given chart. The reference data should be replaced with the measurements of the colour chart in order to obtain the best measurement.[16] The supported file formats include plain text and Microsoft Excel files. The colour data is provided as L*a*b*[17], along with D (Density – optical density) for greyscale.

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13 The author would like to underscore that thanks to its design, the OpenDice software can be relatively easily expanded with scripts that enable automating certain operations, which is important when processing large volumes of files (editor's note).

14 The ColorChecker Classic colour chart family features 24 fields (including 6 in greyscale) in various sizes: Classic, Mini, Nano, XL, Mega; calibrite.com/us/product-category/capture-solutions/ (accessed 19 April 2023).

15 www.digitizationguidelines.gov/guidelines/digitize-technical.html (accessed 19 April 2023).

16 Manufacturers of certified colour charts provide factory colour values for individual fields; however, if a very precise measurement is needed, they should be verified using the colour chart on hand or have it validated and certified by a third party (editor's note).

17 L*a*b refers to a metrological model of the colour space described by three parameters, where L stands for perceptual lightness, while a and b values describe the ratio of green and red, as well as blue and yellow (editor's note).

Files containing colour chart pictures have to match the selected chart type; otherwise, they will be rejected by the software. In the latest versions, OpenDICE only supports images with the correct orientation; the maximum allowed skew cannot exceed 5 degrees.

OpenDICE automatically recognises the relevant fields for the most popular colour charts; however, selecting the four corners of the chart is generally recommended, as this makes the analysis faster and more precise. If the positioning of the automatically recognised fields is incorrect, it can be adjusted manually.

Once the fields are selected properly, the analysis can be launched. The process may take up to several minutes depending on the complexity of the colour chart and the computer's power. The results are presented in two windows for colours, with spatial analysis results displayed in the third window.

The colour accuracy window displays the results of luminance, dE 2000, register accuracy (corresponds to the correctness of the colour channels from the FADGI table) tests, as well as a summary.

The luminance (L*) shows the difference between the measurement result and the benchmark value. Delta E corresponds to the dE 2000 parameter for all fields, along with the comparison of the mean, median and expected results from the pre-selected profile (by default the *Bound Volumes*: *General Collections* is used) and quality (4 stars by default). Registration accuracy is only calculated for GoldenThread charts. The summary presents all the results displayed as a single text-based list, both global and for individual fields.

The tone response analysis window displays the results of the OECF curve test,[18] distortion, white balance, uniformity, noise and summary.

The OECF curves display RGB and luminance curves. The distortions show how the OECF curves deviate from the expected values. The white balance shows how the white balance in the grey fields deviates from the expected values. Uniformity is the measure of the homogeneity of the lighting across the surface of the entire colour chart – this test is not available for ColorChecker colour charts. The noise tab contains results for noise value tests for the grey fields. The summary works in the same manner as for the previous window.

Some colour charts allow for spatial testing. These include the GoldenThread and UTT charts.[19] The last window features the results of the

18 The Opto Electronic Conversion Function (OECF) enables testing illumination quality in individual greyscale segments.

19 The Universal Test Target (UTT) is a colour chart developed in 2009 and subsequently released under an open licence, which enables third parties to manufacture its copies. For example, the A4-sized variant manufactured by Image Engineering and sold by Digital Transitions costs 819 USD; heritage-digitaltransitions.com/product/universal-test-targets-and-software-utt/ (accessed 28 May 2024).

SFR and sampling efficiency tests in different regions of the image – in the centre and in the four corners.

RIPT

The Rijksmuseum Image Performance Tool (RIPT) is an Excel spreadsheet developed by the Dutch Rijksmuseum to measure the quality of photographs.[20] It only supports the ColorChecker Digital SG colour chart;[21] however, this solution is worth showcasing due to the platform it is based on, which may serve as a source of inspiration for creating bespoke independent solutions. The tool does not allow for carrying out a colour analysis of the photographed colour chart; it can be used for visualising measurements obtained using tools such as delt.ae.

The aim of RIPT is to compare the measured LUT values[22] of the colour chart and the values obtained from the file. The authors emphasise the need to use the ColorChecker Digital SG spectrophotometer[23] for taking measurements, which is based on numerous experiments carried out using this colour chart.[24]

The tool allows for measuring exposure, illumination, OECF, gain modulation, dE 1976 and dE 2000, as well as white balance and reflection components.

To start, the operator needs to fill in a file with the data obtained from the colour chart with a spectrophotometer. According to the manual, these values need to be reviewed and validated twice a year. At that point, the tool needs the data from the photographed colour chart. There are 140 fields – it might be a good idea to use the CSV file generated by delt.ae[25], which can be downloaded once the picture has been uploaded for analysis. The download link can be found at the bottom right of the page.

The result can be seen immediately in the 'general overview' tab. The tab contains overall results for the Metamorfoze[26] and FADGI guidelines along with the result expressed as a colour (green for positive,

20 2and3dmagazine.rijksmuseum.nl/23d-photography-2022/introduction (accessed 21 April 2023).

21 calibrite.com/pl/product/colorchecker-digital-sg/ (accessed 21 April 2023).

22 The Look Up Table (LUT) can be described as a predefined image filter(editor's note).

23 A spectrophotometer is 'a colour measuring device that shines a beam of light and records the amount of light reflected or transmitted to quantify colour' (according to X-Rite). More information: www.xrite.com/pl-pl/blog/what-does-a-spectrophotometer-measure.

24 heritagesciencejournal.*springeropen*.com/articles/10.1186/s40494-021-00536-x (accessed 21 April 2023).

25 The objective is to move away from using this platform; this is discussed in more detail in the following chapter.

26 www.metamorfoze.nl/sites/default/files/documents/Metamorfoze_Preservation_Imaging_Guidelines_1.0.pdf (accessed 21 April 2023).

red for negative), as well as OECF and gain modulation. The latter are displayed as charts. The remaining tabs show the detailed results for dE 1976 and dE 2000 tests.

RIPT does not clearly define which FADGI profile is tested; however, the selection of critical values points to the Prints and Photographs profile.[27]

deltae.py

The third option is deltae.py,[28] a command-line interface tool developed by the author of this paper. It is distributed under the MIT open-source licence.[29] The solution is actively developed, which means it is going to change over time; however, its basic features enable testing dE values and compliance with FADGI guidelines.

The software supports the following colour charts:

– ColorChecker family: Classic, Mini, Nano (including double-row variants – greyscale and BGRYCM[30]); as of the latest version (5 July 2024), it does not support ColorChecker Digital SG,
– GoldenThread family: Device Level Target, Object Level Target – all three sizes.

The software supports the four basic chart orientations: S, N, W, E, or 0, 90, 180, 270 and 360 degrees. This means that in the case of the ColorChecker chart, the grey row can be at the bottom, left, right or top side. The roadmap includes automatic orientation detection – the current version of the software requires declaring the orientation using a command line option; by default, the grey row is expected at the bottom.

Deltae.py uses the manufacturer-declared values for the colour fields; if required, these values can be expanded with custom data.

The field recognition system is based on percentages of the position of the fields in the file. This approach was inspired by ArgyllCMS.[31]

The key benefit of this approach is the ability to easily create custom field maps. For example, the ColorChecker chart can be cut into pieces in order to create a long, narrow chart to place next to the photographed object instead of a large rectangular shape obscuring the view.[32]

This, however, requires framing the chart very precisely before using the software to analyse the photograph:

– for ColorChecker Classic and Mini using the white markers in the corners; for testing half values, the + in the middle needs to be cut;

27 www.digitizationguidelines.gov/guidelines/FADGI%20Federal%20%20Agencies%20Digital%20Guidelines%20Initiative-2016%20Final_rev1.pdf, p. 33 (accessed 21 April 2023).

28 github.com/vvizzo/deltae (accessed 21 April 2023).

29 opensource.org/license/mit/ (accessed 21 April 2023).

30 Blue – Green – Red – Yellow – Cyan – Magenta.

31 www.argyllcms.com/ (accessed 21 April 2023).

32 This is what the Royal Castle in Warsaw once used to do.

– for ColorChecker Nano using the physical borders of the chart; for testing half values, the chart needs to be trimmed to the borders of the colour fields;
– GoldenThread Object Level large and medium should be trimmed at the outer yellow border;
– GoldenThread Device Level and Object Level small should be trimmed along the black border.

Example of use:

```
deltae.py -c cc24 -o S testfile.tif
```

The software will create two files. The text file will contain information on colour data, basic equipment information based on the EXIF metadata and a brief summary of selected colour parameters using the FADGI method.

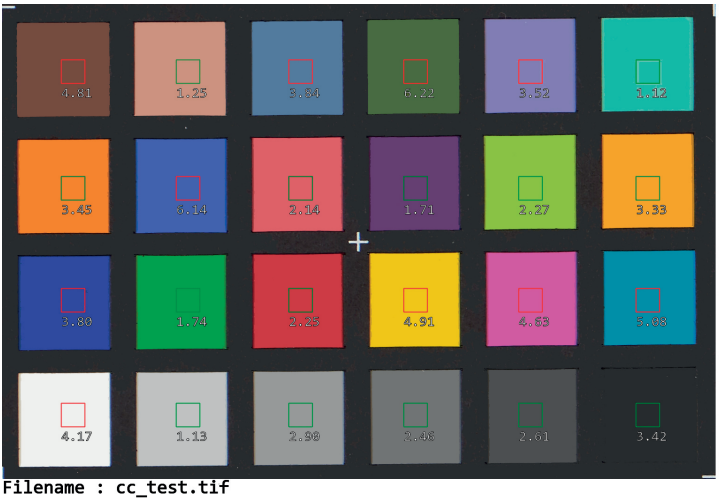
```
[05-29 08:13 /cygdrive/c/Users/xxxxxxxxxxx/Desktop]$ deltae.py cc_test.tif
A1: Lab - 33.963, 20.162, 16.321,     RGB - 103.71, 68.86, 58.59,       dE2k - 4.811
A2: Lab - 58.774, 36.137, 56.459,     RGB - 190.21, 113.43, 48.25,      dE2k - 3.448
A3: Lab - 27.113, 13.167, -54.772,    RGB - 34.52, 63.34, 146.72,       dE2k - 3.802
A4: Lab - 89.458, 0.251, 1.501,       RGB - 225.84, 224.58, 221.99,     dE2k - 4.168
B1: Lab - 66.189, 19.352, 17.450,     RGB - 187.62, 146.84, 130.83,     dE2k - 1.253
B2: Lab - 39.991, 6.439, -53.067,     RGB - 61.72, 94.71, 178.68,       dE2k - 6.144
B3: Lab - 52.988, -38.492, 34.215,    RGB - 94.93, 142.17, 70.65,       dE2k - 1.744
B4: Lab - 81.416, 0.190, 0.338,       RGB - 202.16, 201.63, 201.14,     dE2k - 1.134
C1: Lab - 50.142, -4.408, -31.606,    RGB - 94.94, 122.87, 170.43,      dE2k - 3.839
C2: Lab - 50.616, 48.635, 20.571,     RGB - 174.06, 81.21, 89.20,       dE2k - 2.142
C3: Lab - 41.036, 52.749, 32.820,     RGB - 152.63, 50.19, 50.64,       dE2k - 2.250
C4: Lab - 69.915, 0.365, -0.078,      RGB - 170.40, 169.78, 170.13,     dE2k - 2.901
D1: Lab - 37.820, -13.387, 30.502,    RGB - 85.09, 95.15, 45.06,        dE2k - 6.216
D2: Lab - 28.132, 23.177, -22.431,    RGB - 81.14, 56.10, 100.36,       dE2k - 1.713
D3: Lab - 75.638, 4.620, 72.019,      RGB - 209.39, 180.76, 54.44,      dE2k - 4.911
D4: Lab - 51.444, 1.497, 0.473,       RGB - 124.01, 121.37, 121.46,     dE2k - 2.459
E1: Lab - 58.588, 11.025, -27.018,    RGB - 139.16, 135.03, 185.96,     dE2k - 3.518
E2: Lab - 68.898, -23.068, 57.044,    RGB - 157.97, 177.95, 67.32,      dE2k - 2.265
E3: Lab - 55.191, 54.892, -13.176,    RGB - 184.61, 87.47, 154.07,      dE2k - 4.628
E4: Lab - 33.333, 0.764, -0.546,      RGB - 80.32, 79.43, 80.56,        dE2k - 2.612
F1: Lab - 71.790, -32.756, -1.067,    RGB - 132.74, 192.00, 176.42,     dE2k - 1.121
F2: Lab - 67.412, 20.060, 69.336,     RGB - 200.86, 148.30, 40.46,      dE2k - 3.328
F3: Lab - 52.320, -31.126, -39.446,   RGB - 37.82, 140.46, 189.52,      dE2k - 5.081
F4: Lab - 16.201, 1.152, -0.179,      RGB - 45.49, 44.11, 44.82,        dE2k - 3.415

Filename: cc_test.tif
Author: -
Camera: NIKON CORPORATION NIKON D810 (8024125)
Lens: Nikon AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED

FADGI2023: prints, photographs, maps, posters, paintings, other 2D art
DeltaE 2000: 3.288 ***
Filetype: TIFF ****
Bit depth: 16 16 16 ****
Color profile: Adobe RGB (1998) ****
Color mode: RGB ****
```

```
Tone response: 5.732 *
White balance: 4.168 **
Lightness uniformity: 2.801% ****
Color accuracy: 5.613 ***
```

The tool will also generate a JPG image file with visual representation of correct and incorrect fields; they are marked with green and red boxes respectively.




```
Filename : cc_test.tif
Author : -
Camera : NIKON CORPORATION NIKON D810 (8024125)
Lens : Nikon AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED

FADGI2023: prints, photographs, maps, posters, paintings, other 2D art
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Tone response: 5.732 *
White balance: 4.168 **
Lightness uniformity: 2.801% ****
Color accuracy: 5.613 ***

2024-05-29, deltae.py, Mikołaj Machowski 2024
```

Fig. 1

Graphical results of the tests carried out using deltae.py software

The solution will ultimately enable the analysis of the entire image file; the files will not need to be cropped to match the colour charts, which will be detected automatically.

In the process of describing the three available solutions, the abysmal user-friendliness of the user interfaces offered by the free solutions is worth noting. While OpenDICE dates back to the 1990s, RIPT is an Excel spreadsheet with all its pros and cons, while deltae.py is a command-line tool; although it is worth pointing out that it may be used as a foundation for a more user-friendly application. All three presented tools require the user to put in more work than a website.

Image sampling rate and ColorChecker

When considering the sampling rate of a photograph, one should keep in mind that the term has two distinct meanings.

The first is the obtained sampling rate, which is measured using the MTF (Modulation Transfer Function) parameter, which provides information on how many individual points can be distinguished over a given length (for example, 300 points per inch, or 25.4 mm). This is only achievable on very precise colour charts, such as GoldenThread or QA62. This parameter cannot be analysed with ColorChecker charts or charts printed on normal printers.[33]

The other kind of a sampling rate is the Claimed Sampling Rate, or the absolute number of pixels obtained in a given section. This does not take into account the quality of these pixels or whether they store any valuable information. The parameter can be calculated using the ColorChecker charts; the method of checking the quality of this sampling rate is described in the final section of the paper.

Although the ColorChecker charts feature a millimetre scale, it is rarely used to measure resolution.

Some users claim it is not calibrated properly; however, after extensive testing on a number of copies, the author believes this is not the case. The scale is calibrated sufficiently to estimate the resolution of the picture taken. The only exception was the manufacturing error concerning the Digital SG charts, where the 0 marker is not printed; as a result, the first centimetre is actually 9 mm long. At the same time, even on the same colour charts, the millimetre markings are at the correct distance from each other. The issues may stem partly from the fact that the way of printing the measuring scale prevents using them for precise measurements. This is compounded by the fact that the colour chart is not always placed with high enough precision in the right depth-of-field zone (due to the focus on colours) which results in slightly blurred result, thus reinforcing the belief in the uselessness of the tool. This can be seen as a case of a self-fulfilling prophecy. GoldenThread colour charts support spatial measurements; however, the chart needs to be in proper focus. This leads to the simple conclusion that analysing spatial parameters requires ensuring that the colour chart (regardless of its type) is within the depth of field of the photograph.

In order to measure the resolution with ColorChecker using the Adobe Photoshop software, the user needs to use the measure tool on a suitably enlarged image (300–400% is sufficient) to mark the segment between e.g. the left side of the long centimetre marker, and the corresponding side of the next marker. In the figure, this distance is equal to 240 pixels. Since the measure is scaled in centimetres, the resulting number denotes ppcm (pixels per centimetre). The pixels-per-inch value can be obtained

33 During the debate one of the participants suggested such a solution; however, the author believes that the print quality required for achieving meaningful MTF test results is unattainable on consumer printers.

by multiplying the resulting value by 2.54; in the case of the example, the end result is 609.6 ppi.

Photograph accuracy and ColorChecker

The ColorChecker does not have specialised fields for testing the MTF parameter, and the use of existing ones does not allow for directly testing the parameter. There is one method that enables comparing the sharpness of photographs with the same representation. It is a series of transformations of similar images, which gives a numerical result that enables the user to determine which picture in the series is the sharpest. This is a version of the contrast detection method employed in cameras.

GLS method

These transformations require applying some amount of Gaussian blur to remove the effects of noise. The noise has sharp boundaries that obscure the image. The method then requires a Laplace convolution transformation[34] and an analysis of the edge quality by analysing the standard deviation of the resulting file.

The use of this method can be demonstrated using the Image Magick open-source software.[35] Other computer image analysis solutions and libraries have similar features.

Considering an ideal file (created using image manipulation software) based on the ColorChecker:

Fig. 2

A perfect ColorChecker

```
magick ideal_cc.tif -blur 5 blurred5_cc.tif
```

The blurring is very subtle, but significant enough to negate the impact of any noise.[36] Then, the Laplace convolution needs to be done:

```
magick blurred5_cc.tif -morphology Convolve Lapla-
cian:0 -auto-level lap_al_ideal.tif
```

34 Laplace convolution has been used for this purpose for a very long time, see e.g. L. S. Davis, 'A survey of edge detection techniques', *Computer Graphics and Image Processing*, vol. 4, 1975, pp. 248–270 (doi.org/10.1016/0146-664X(75)90012-X).

35 imagemagick.org/ (accessed 21 April 2024).

36 In this particular case this step is not necessary; it was included for the sake of presenting a comprehensive process.

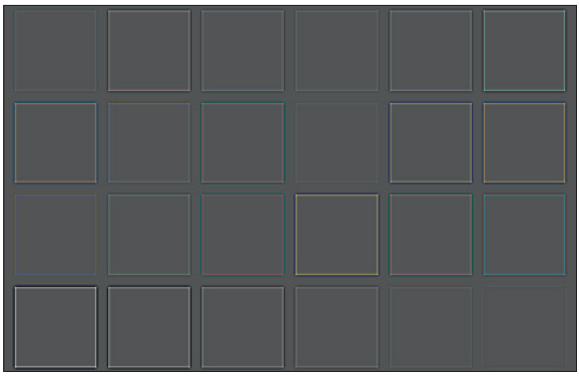

Fig. 3

Laplace convolution result on a perfect chart

At that point standard deviation can be established:

```
identify - verbose lap_al._ideal.tif | grep „standard deviation” | head -1
standard deviation: 12.217 (0.0479099)
```

The head -1 command will display the parameter for the entire image; otherwise the output will include the components for each channel separately, which is not necessary in this case.

The value 12.217 is the base value for our chart.

Applying Gaussian blur with a radius of 10 to the perfect image and repeating the operation yields the value of 13.4066 – higher values correspond to worse results.

Pictures may not be compared to the ideal chart, since each has its own characteristics; only images of the same chart can be compared with each other. What is more, changing lighting conditions will also have an impact on the texture of the chart. Any fibre, imprecise trimming of the mask on the CC chart will affect the final result. This is what the Laplace effect looks like on a real CC chart:

Fig. 4

Laplace convolution result on a real chart

The baseline score for this chart and the scene is 4.5388.

This method is not universal and it does not provide absolute results; however, it can prove useful for serial shots of flat objects taken in studio conditions with constant lighting. In these cases, it may be used to find possible focus issues.

Conclusions

Colour analysis of photographs can be carried out with other solutions – users are not forced to use delt.ae. The paper outlines two other software solutions that enable colour chart analysis (OpenDICE, deltae.py) and one solution that analyses the results obtained with other tools, such as deltae.py. These are just some of the solutions available under open-source licences. Parameters from the ArgyllCMS package can also be employed for the analysis.

The spatial analysis proves more problematic. The lack of professionally-made templates that enable MTF/SFR testing limits the available methods to anomaly detection; this might be helpful in the context of batch image analysis, but will prove insufficient for the analysis of a single image.

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