



BSI Standards Publication

Photography — Digital cameras

Part 2: Texture analysis using stochastic pattern

National foreword

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Partie 2: Analyse de la texture en utilisant un modèle stochastique



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared jointly by Technical Committee ISO/TC 42, *Photography* and Technical Committee IEC/TC 100, *Audio, video and multimedia systems and equipment*. The draft was circulated for voting to the national bodies of both ISO and IEC.

A list of all parts in the ISO 19567 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In a general context, texture refers to the visual and tactile surface quality derived from the physicality of a material and the roughness or graininess of its surface. For digital still camera images, texture is restricted to the visual surface quality and the characteristic of texture reproduction in the captured image can be interpreted as the reproduction of the low contrast fine details. This document specifies the measurement of how cameras reproduce texture defined as low contrast fine details.

The on going tendency to utilize smaller sensors with higher pixel counts in some cameras leaves a very small amount of light reaching each individual pixel. With the signal getting smaller and the noise level remaining at a certain level, it is necessary to reduce the noise in the image processing after capturing the image. Although the algorithms used for noise reduction have been developed over time, they are still not able to differentiate texture in the actual scene from the unwanted noise introduced by the capturing system. This decreases the image quality and it is therefore helpful to have a method to measure the loss of texture. Texture may also be enhanced to increase the acutance of the image. The texture reproduction is dependent on frequency and contrast because the noise reduction and the acutance enhancement, etc., are nonlinearly dependent on the values of the surrounding pixels.

This document specifies methods to measure texture reproduction using test charts with a stochastic pattern. [Annex A](#) talks about the differentiation of this document from ISO/TS 19567-1, which deals with cyclic pattern. The test charts described here are based on randomly arranged circles of various sizes and colour with a limited contrast. This provides a target with known structure and spatial statistics similar to natural images. The measurement results are presented in SFR (Spatial Frequency Response) curves from which a single value representing the overall texture content is derived.

In general if one measured SFR is greater than the other across all measured spatial frequencies, a larger amount of texture is reproduced in the corresponding image. If two SFRs have a crossover point and the larger SFR depends on the frequency range, relative ordering of texture preservation quality is less clear. Comparison of the measurement results can provide important information about the relative texture reproduction of the captured images.

While the measurement method specified in this document is for objective evaluations of texture reproduction for images, their relationship to subjective evaluations of texture reproduction with visual perception is important to give attention, since image quality for camera/photograph users generally accords with subjective evaluation. [Annex C](#) explains possible inconsistency between measurement results using the method described in this document and subjective evaluations, due to different condition of noise, with experimental results for images.

Photography — Digital cameras —

Part 2:

Texture analysis using stochastic pattern

1 Scope

This document specifies a protocol to measure the texture reproduction in images captured and processed by digital cameras including cameras in other devices e.g. in camera phones.

This document specifies protocols for the measurement of texture reproduction using test charts with stochastic pattern.

NOTE The measurement method specified in this document is for objective evaluations of texture reproduction, of which the results are sometimes inconsistent with subjective evaluations (See [Annex C](#)).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

texture

low contrast fine details, which appear in objects

EXAMPLE Low contrast fine details, which is visible in foliage, fur, sand, textiles, grass, or masonry surfaces.

3.2

texture reproduction

response in the output image of cameras to the texture of the object in the scene

4 Test conditions and methods

4.1 General

The measurement shall be carried out using digital images of the texture test chart captured by a digital still camera.

The following measurement conditions should be used as nominal conditions when measuring the texture reproduction of a digital still camera. If it is not possible or appropriate to achieve these nominal operating conditions, the actual operating conditions shall be listed along with the reported results.