

SYSTEM FOR SHARPNESS EVALUATION OF PHOTOS OF PEOPLE

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Evaluating the sharpness of an image is an important step in image processing and image quality assessment. It allows to classify images based on their overall sharpness, which can help professionals do the work of image editing faster.

There are multiple algorithms that can achieve image sharpness evaluation: FFT (Fast Fourier Transform) [1], Variance of the Laplacian, analyzing of the curvelet domain [2], spatial domain [3], etc. These methods have high evaluation costs and are not always effective when analyzing images with a shallow depth of field, which has natural background blur. Such effect of the natural depth of field blur is quite noticeable when using telephoto lenses with an open aperture setting.

The goal of this article is to describe the components and technologies of a system which can solve the issue of sharpness evaluation of photos of people, which contain naturally blurred background. The general idea of the system is to evaluate only the sharpness of the subjects (faces) which were intended to be in focus (this method relies on face detection, metadata analysis, distance calculation). The system will use FFT and Variance of the Laplacian, implementations of which are available in a library called OpenCV. It contains numerous instruments for image processing in general. Since the system will be working with hundreds of images, which are inconvenient to be uploaded through the cloud, this cannot be a server-based solution. All of the work needs to be done locally. The language that can be used for development is Python. It has many built-in utilities for working with images. The architecture of the developed system must be modular. Such modular design will allow the system to be easily configured for new sharpness detection algorithms, adapt to new factors which may be having an impact on the evaluation accuracy.

In conclusion it can be stated, that applying the well-known algorithms of sharpness evaluation is not optimal for cases when the input images are expected to contain large quantities of natural blur. A system was proposed which solves this problem by applying these algorithms only to areas which were intended to be in focus. This is achieved by analyzing the photo metadata and face detection.

References

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