Fast recognition of natural feature identifiers by a mobile phone

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As privacy issues are becoming increasingly important, concealing the identities of individual persons or objects is essential for the analysis of the mass amount of data captured by cameras or other means about our world, that is full of artificial and natural identifiers. For reliable anonymization or de-identification, techniques are required to automatically recognize identifying features, markers, patterns, and to manipulate the data so that the content can still be used for the intended purposes without any privacy issues.

When coming to the automatic identification/recognition of objects, algorithms are needed to automatically locate and decode the identifiers attached to the objects. Very different techniques are required for natural biometric IDs, such as fingerprints, iris or retina patterns, and for artificial IDs, such as barcodes or QR codes [1, 2].

Barcode technology is the pillar of automatic identification, that is used in a wide range of real-time applications with various types of codes. The different types of codes and applications impose special problems, so there is a continuous need for solutions with improved effectiveness. Barcode localization methods have two objectives, speed and accuracy. For industrial environment, accuracy is crucial since undetected (missed) codes may lead to loss of profit. Processing speed is a secondary desired property of the detectors. On smartphones, the accuracy is not so critical, since the device interacts with the user and re-shoting is easily possible, but a fast (and reasonably accurate) barcode detection is desirable.

In this paper, we focus on the automatic localization and recognition of a kind of natural feature identifier (NFI). We present an algorithm that successfully locates NFI code region in an image taken by a camera, extracts features of the NFI that can be the basis for recognition or matching. We show our preliminary experimental results using a moderate set of labels and images.

References

[1] L. Belussi and N. S. T. Hirata, "Fast qr code detection in arbitrarily acquired images," in Graphics, Patterns and Images (Sibgrapi), 2011, pp. 281-288

[2] I. Szentandrási, A. Herout, and M. Dubská, "Fast detection and recognition of qr codes in high-resolution images," in Proceedings of the 28th Spring Conference on Computer Graphics, 2013,pp. 129-136