

Claims

1. A computer-implemented method of assessing the quality of at least one retinal image of an eye of a subject, the method including:

5 (a) generating at least one region quality score for the retinal image by:

(i) identifying at least one region of interest (ROI) in the retinal image, the ROI being a region image of a predefined structural portion of the eye;

10 (ii) extracting one or more region image features of the region of interest; and

(iii) generating a region quality score for the region of interest, using the region image features extracted for the region of interest and an adaptive model;

(b) generating a full quality score for the full retinal image by:

15 (i) extracting one or more full image features of the full retinal image; and

(ii) generating a full image quality score for the full retinal image, using the full image features extracted for the full retinal image and the adaptive model; and

20 (c) assessing the quality of the retinal image by comparing the region quality score and full quality score against predefined criteria,

wherein the adaptive model is obtained using previously obtained region image features and full image features of retinal images of other eyes.

25 2. The method according to claim 1, in which there is a ROI for at least one of (i) the optic disc of the eye and (ii) the macula.

3. The method according to claim 1 or 2, in which the ROI is identified according to a predetermined order of ROIs in the retinal image.

4. The method according to any one of claims 1 to 3 in which each of the region image features and full image features include one or more of:

a contrast measure;

a blur measure;

5 an entropy measure; and

a blood vessel density measure.

5. A method of assessing an image comprising:

determining whether the image is a retinal image; and

10 if the determination is positive, assessing the quality of the image by the method according to any of claims 1 to 4.

6. The method according to claim 5, in which the determination is performed using at least one of:

15 a process of extracting bag-of-words (BoW) features of the image, and classifying the image using a bag-of-words classifier; and

a structural similarity index (SSIM) classification performed by obtaining a numerical measure of the similarity of a plurality of characteristic numerical values of the image and characteristic numerical values of previously-obtained
20 images of other eyes.

7. The method according to claim 6, in which the determination is performed by:

making an initial classification using said bag-of-word classifier; and

25 using said SSIM classification to re-evaluate images which were classified as not being retinal images by the bag-of-words classifier.

8. The method of obtaining information about an eye using a retinal image of the eye, comprising:

30 assessing the quality of the image by the method according to any one of claims 1 to 7;

determining if the region quality score and full quality score meet the predefined criteria; and

if the determination positive, obtaining the information about the eye by analysing the image.

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9. The method according to any one of claims 1 to 7, in which the predefined criteria comprise predefined thresholds of the region quality score and full quality score.

10 10. A computer system comprising a processor and a data storage device storing computer program instructions operative, upon performance of the instructions by the processor, to cause the processor to perform a method according to any of claims 1 to 9.

15 11. A computer program product, such as a tangible data storage device, storing computer program instructions operative, upon performance of the instructions by a processor, to cause the processor to perform a method according to any of claims 1 to 9.