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ADAPTIVE METHOD FOR OPTIC DISC DETECTION IN SMARTPHONE-CAPTURED FUNDUS IMAGES

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The Optic Disk (OD) is a main anatomic structure in fundus image. The OD detection presents an important step in many diagnostic systems for ophthalmic diseases. As an example, several works proceed to locate ROI having a higher contrast, and hence remove the OD in order to deduce Hard Exudates or drusens, which correspond to the Moderate Diabetic Retinopathy and the Age-related Macular Degeneration, respectively. Moreover, other works detect the OD and then the neovascularized vessels or the optic cup in order to deduce respectively the Proliferative Diabetic Retinophathy and the Glaucoma. The smartphone use is growing in ophthalmology where several optical lenses have been introduced to capturing the retina. Our work described in proposes a mobile computer aided system for OD detection using the D-EYE lens Such system allows ophthalmologic diagnosis in remote locations with limited access to clinical facilities. Moreover, our system promotes the telemedicine for eye examination. However, several differences are distinguished between fundus images captured with different optical lenses. In fact, each lens requires a specific distance from fundus. Moreover, the handheld aspect leads to different angles of view. Consequently, the OD is illustrated with different sizes and locations in the fundus which leads to an inaccurate OD detection. This paper proposes an adaptive method to detect OD in fundus image captured by different optical lenses where OD size sOD is provided by the user. Thereafter, the fundus image is splitted into sub-images in terms of the sOD. Then, Radon Transform (RT) projections are modelled based on sOD in order to be applied to all sub-images. Afterwards, the RT results are then explored to select the sub-image containing the OD. The experimental results indicate that our adaptive method provides a higher performance of OD detection in fundus images captured by different optical lenses.]

Biography

Yaroub Elloumi, received his PhD in co-Supervision with the University of Paris-Est Marne-la-Vallee (France) and the University of Sfax (Tunisia) in 2013. He received his MS in Real-Time Systems from the University of Sousse (Tunisia) in, 2008. He currently teaches and does research with the position of Assistant Professor in Computer Sciences. He is a member of both Gaspard Monge Computer Science Laboratory (LIGM CNRS UMR 8049) and Medical Technology and Image Processing Laboratory (LabTIM LR12ES06). His research interests are computer vision, parallel computing and real-time image processing.

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