Original Manuscript ID: sensors-1554457

Original Article Title: "Deep learning glaucoma screening: segmentation vs classification"
New Article Title: "Deep learning for glaucoma screening using retinal images from retinography and mobile devices"

To: Sensors
Re: Response to Reviewers

Dear Editor,

Thank you for allowing a resubmission of our manuscript, with an opportunity to address the reviewers' comments. We appreciate the reviewers for taking the time to analyze our paper carefully and for providing valuable feedback to help us improve the quality of the paper.

We have made every effort to eliminate all the indicated minor inconsistencies and do hope that as a result, the quality of our revised manuscript has improved further. We are uploading (a) our point-by-point response to the comments (below) (reply to reviews), where concerns and comments are marked with red, our responses are marked with black, and the added text in the article is marked with blue.

Best regards,

Alexandre Neto et al.

Reviewer 2

This paper explores and compares the contributions of classification and segmentation CNNs methods for automatic glaucoma screening with retinal images acquired both by retinographers and a mobile device. The methods and data analyses are well described. The results are solid. Overall, I suggest minor revisions from authors. Here are my comments.

As mentioned in the introduction, the examination of the OD is important since glaucoma begins to form a cavity and develops an abnormal depression/excavation. What's are the key points for diagnosis the disease based on such image data? And why the deep learning glaucoma screening can enhance the conventional methods?

Author response and action: Thank you for your valuable comments. As mentioned in the text:

The examination of these fundus images is important because the ophthalmologist can record indicators and parameters related to cupping to detect glaucoma, such as disc diameter, the thickness of the neuroretinal rim decreasing in the order inferior (I) > superior (S) > nasal (N) > temporal (T) (ISNT rule), peripapillary atrophy, notching and cup-to-disc ratio (CDR) being this last the most used measurement by specialists [3–5].

Usually, glaucoma is diagnosed by the patient's medical history, measures of Intraocular Pressure (IOP), visual field loss test, and manual evaluation of the Optic Disc (OD) with ophthalmoscopy to examine the shape and colour of the optic nerve. The examination of the OD is important since glaucoma begins to form a cavity and develops an abnormal depression/excavation, at the front of the nerve head, called optic cup that in advanced stage helps on the progression of glaucoma, blocking the OD (Figure 2) [6–8]. After gathering the retinal images, they must be inspected and analysed looking for indicators of ophthalmologic pathologies. These diagnostic systems offer the potential to be used on large scale for an early diagnosis and treatment of glaucoma. Still, they require subjective evaluation by qualified experts, and it is time-consuming and costly to inspect each retinal image manually. This way the Deep Learning (DL) algorithms help on the automatic screening of glaucoma and assists ophthalmologists achieve higher accuracy on the glaucoma screening, especially on repetitive tasks [3,6,9].