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AUTHORS

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Commercial Relationships Disclosure (Abstract): Sandra Belalcazar: Commercial Relationship: Code N (No Commercial Relationship) | Hernan Rios: Commercial Relationship: Code N (No Commercial Relationship) | Vanessa Carpio: Commercial Relationship: Code N (No Commercial Relationship) | Oscar Perdomo: Commercial Relationship: Code N (No Commercial Relationship) | Claudia Carvajal: Commercial Relationship: Code N (No Commercial Relationship) | Fabio Gonzalez: Commercial Relationship: Code N (No Commercial Relationship) | Henning Müller: Commercial Relationship: Code N (No Commercial Relationship)

Study Group: (none)

ABSTRACT

TITLE: Convolutional Neural Networks for identification and classification of optic nerve damage features

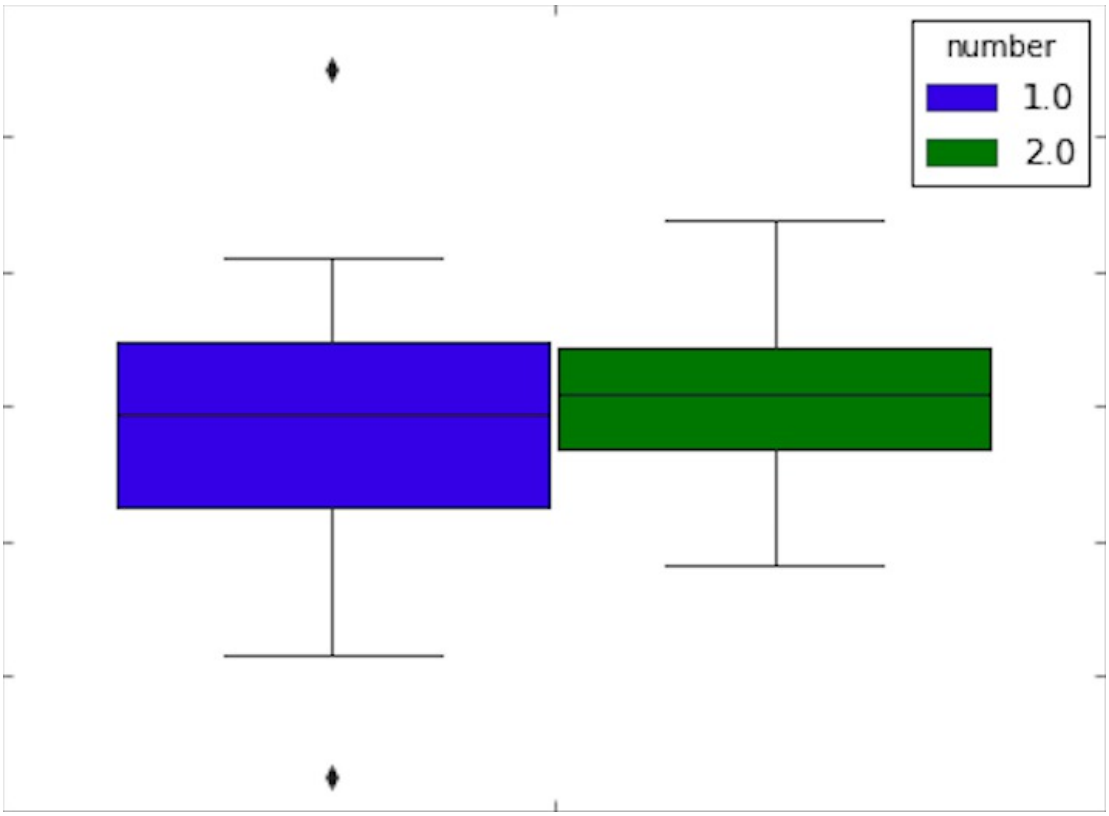
ABSTRACT BODY:

Purpose: Optic nerve damage is one of the main features for identification of Glaucoma. The convolutional neural networks are a promising tool for early detection of several diseases using medical images, with great importance in developing countries, where access to medical services is difficult. The purpose of the study was to determine the accuracy of convolutional neural networks to identify early optic nerve damage features on optic nerve photographs as a method for automatic detection of Glaucoma suspects

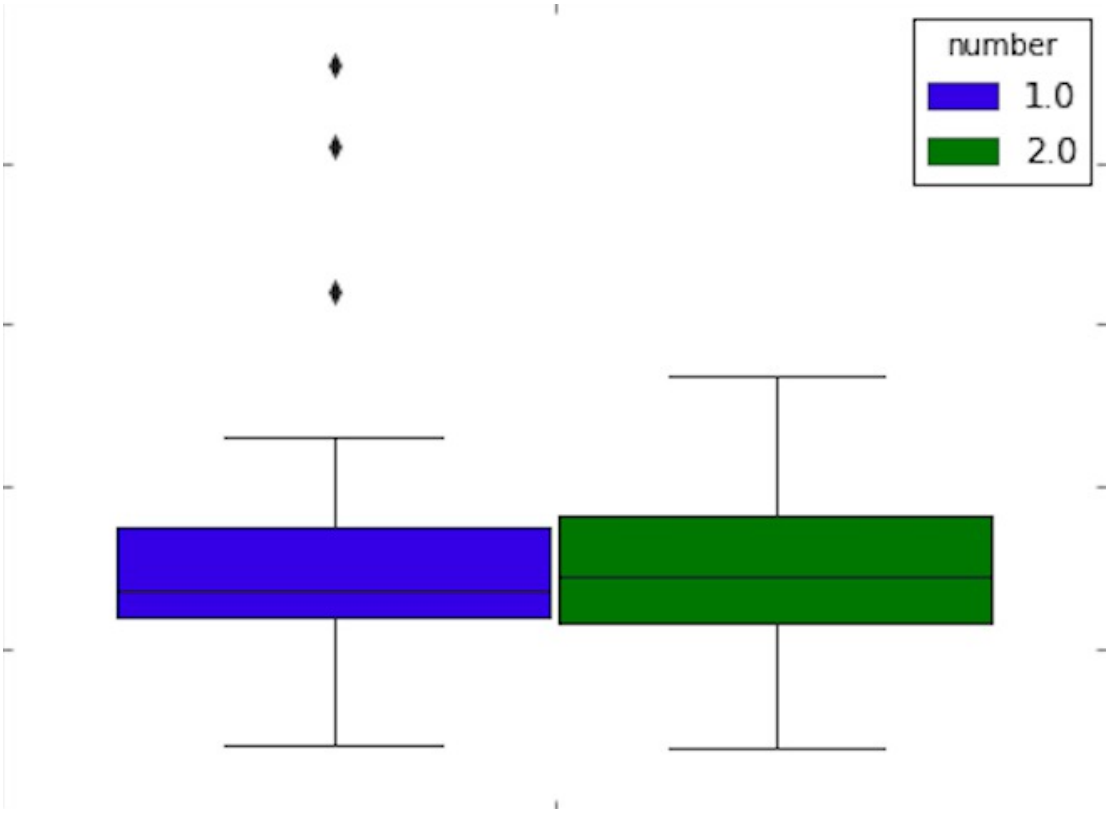
Methods: A cross-sectional diagnostic test study was made. A designed model based on convolutional neural networks was used to analyze optic nerve photographs and automatically segment the optic disc, measuring the total optic disc diameter, the thinnest ring radius and the ratio between these two parameters to estimate the optic nerve damage

Results: The experimental results shown that the proposed model is able to calculate the total diameter, the thinnest ring radius and the ratio with a mean absolute percentage error of 9.9%, 23.9% and 24.8% respectively

Conclusions: Convolutional neural networks show good performance in detection of early optic nerve damage features. This study is the first step to build a telemedicine tool to support physicians to detect glaucoma suspects using optic nerve photographs



Boxplot of model predictions (Blue = Convolutional Neural Network) versus measure taken by expert (Green = Ophthalmologist) about optic nerve total diameter



Boxplot of model predictions (Blue = Convolutional Neural Network) versus measure taken by expert (Green = Ophthalmologist) about optic nerve thinnest ring radius

Layman Abstract (optional): Provide a 50-200 word description of your work that non-scientists can understand. Describe the big picture and the implications of your findings, not the study itself and the associated details.: This study evaluated the ability of a convolutional neuronal network to automatically identify optic nerve damage features on optic nerve photographs

DETAILS

PRESENTATION TYPE: #1 Poster, #2 Paper
CURRENT REVIEWING CODE: 2510 imaging: image processing and analysis methodologies - MOI
CURRENT SECTION: Multidisciplinary Ophthalmic Imaging Cross-sectional Group
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Other Registry Site (Abstract): (none)
Registration Number (Abstract): (none)
Date Trial was Registered (MM/DD/YYYY) (Abstract): (none)
Date Trial Began (MM/DD/YYYY) (Abstract): (none)
Grant Support (Abstract): No
Support Detail (Abstract): None

TRAVEL GRANTS and AWARDS APPLICATIONS

AWARDS:

AFFIRMATIONS

Affirmations: Affirmation that submission of this abstract has been approved by the Principal Investigator.
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