Shicheng Guo <guoshicheng2005@gmail.com>

Invitation to review a paper for PLOS ONE (PONE-D-14-25713R1) - Area and volumetric density estimation in processed full-field digital mammograms for risk assessment of breast cancer - [EMID:dc34a37c2520e04b]

1 message

PLOS ONE <em@editorialmanager.com> Sat, Aug 23, 2014 at 1:18 PM
Reply-To: PLOS ONE <plosone@plos.org>
To: Guo Shicheng <guoshicheng2005@gmail.com>

Dear Shicheng,

I am writing to invite you to review a manuscript for PLOS ONE entitled "Area and volumetric density estimation in processed full-field digital mammograms for risk assessment of breast cancer" (PONE-D-14-25713R1).

Please note that if an "R" appears towards the end of the manuscript number, this may be a revised version of a manuscript you'd previously reviewed.

The author list and abstract are appended below, plus more detailed information about PLOS ONE and its editorial criteria.

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With kind regards,
Prof. Momiao Xiong
Academic Editor

Manuscript #: PONE-D-14-25713R1
Title: Area and volumetric density estimation in processed full-field digital mammograms for risk assessment

of breast cancer
Authors: Abbas Cheddad; Kamila Czene; Mikael Eriksson; Jingmei Li; Douglas Easton; Per Hall; Keith Humphreys

ABSTRACT:

Introduction: Mammographic density, the white radiolucent part of a mammogram, is a marker of breast cancer risk and mammographic sensitivity. There are several means of measuring mammographic density, among which are area-based and volumetric-based approaches. Current volumetric methods use only unprocessed, raw, mammograms, which is a problematic restriction since such raw mammograms are normally not stored. We describe fully automated methods for measuring both area and volumetric mammographic density from processed images.

Methods: The data set used in this study comprises raw and processed images of the same view from 1462 women. We developed two algorithms for processed images, an automated area-based approach (CASAM-Area) and a volumetric-based approach (CASAM-Vol). The latter method was based on training a random forest prediction model with image statistical features as predictors, against a volumetric measure, Volpara®, for corresponding raw images. We contrast the three methods, CASAM-Area, CASAM-Vol and Volpara directly and in terms of association with breast cancer risk and a known genetic variant for mammographic density and breast cancer, rs10995190 in the gene ZNF365. Associations with breast cancer risk were evaluated using images from 47 breast cancer cases and 1011 control subjects. The genetic association analysis was based on 1011 control subjects.

Results: All three measures of mammographic density were associated with breast cancer risk and rs10995190 ($p < 0.025$ for breast cancer risk and $p < 1\times10\text{-}6$ for rs10995190). After adjusting for one of the measures there remained little or no evidence of residual association with the remaining density measures ($p > 0.10$ for risk, $p > 0.03$ for rs10995190).

Conclusions: Our results show that it is possible to obtain reliable automated measures of volumetric and area mammographic density from processed digital images. Area and volumetric measures of density on processed digital images performed similar in terms of risk and genetic association.

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4. Conclusions are presented in an appropriate fashion and are supported by the data.
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7. The article adheres to appropriate reporting guidelines and community standards for data availability.

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