Reviewer's report

Title: Automated analysis of digital confocal scanning laser ophthalmoscopy fundus autofluorescence images of geographic atrophy in advanced age-related macular degeneration

Version: 2 Date: 14 December 2004

Reviewer: Fridbert Jonasson

Reviewer's report:

General
This pilot study is of considerable interest. Using their technique including vessel detection with default parameters the authors are able to delineate accurately the areas of geographic atrophy in high percentage of cases in relatively short time.

Limitations of previous manual/semi automated methods evaluating fundus autofluorescence images in geographic atrophy included subjectivity, some considerable skills needed and that they are time consuming. The authors have developed what appears to be an important tool both for multicenter epidemiological studies and also for longitudinal studies of geographic atrophy (GA). This new method may also be helpful identifying subtypes of geographic atrophy, predicting probable clinical course of the disease and evaluating different treatment modalities in clinical studies. The results for this automated analysis suggest that it is at least comparable in agreement and objectivity to the two previous methods used. One of the aims of the new system was improved effectivity and increased speed in reading GA images. This seems to be achieved. Additionally this new method appears to allow evaluation of some of the images previously disregarded because of poor quality.

The English needs be improved by having an English-speaking professional read through the manuscript. Some of the co-authors (Holz?) can also do this. There are several grammatical errors, wrong selection of words and some sentences cannot be understood. The Discussion could be shortened and made more concise. It should indeed be rewritten to some extent.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

I would suggest to change the title from: “Automated analysis of digital confocal scanning laser ophthalmoscopy fundus autofluorescence images of geographic atrophy in advanced age-related macular degeneration.”
To: “Automated analysis of digital confocal scanning laser ophthalmoscopy fundus autofluorescence images of geographic atrophy in age-related macular degeneration.”

Abstract:
Methods, Page 2, line 1: “...allows to process images with lower quality.” Allows images of lower quality to be processed? Please explain further.

Results, Page 2, line 1: “The new method (C) identifies vascular structures that interfere with GA.”
Do these vascular structures not rather interfere with the delineation of GA?
Page 2, Results, line 1 & 2. “It is not inferior to formerly used procedures (A; B).” ? May be the authors are suggesting that the new method is comparable to the two previously used procedures (A B).
Conclusion, Page 2, line 1: “The novel procedure compares in objectivity and inter-reader agreement to established ways to quantify GA.” May be the authors are suggesting that: “The novel procedure compares favorably in objectivity and inter-reader agreement to established ways of quantifying GA.” Next sentence: “It has the potential of speeding up ...etc” Has it the potential or does it speed up the process?

Background, Page 3, line 1: “Age-related macular degeneration (AMD) has become the most common cause of legal blindness in industrialized nations beyond 50 years of age [1-4]." I would suggest: “Age-related macular degeneration (AMD) is the most common cause of legal blindness among industrialized nations beyond age 50 years (1-4).”

Methods, Page 4, line 17: “and instead of this the contour is minimally smoothed and widened there.” I think the last word “there” is redundant and in the following line may be “thus” is more appropriate than “so”.
Page 4, fifth line from bottom: “Images of bad quality often contain....”. I would suggest using “poor” rather than “bad” quality.
Page 4, fourth line from bottom: “....before achieving the true borders of the GA.” Do the authors mean: “.... before identifying the true borders?...”.

Validation, Page 5, line 2: “The data for both eyes exist [13] and are used for validating.” I would suggest for instance: “The data for both eyes is available and is used for validating in the present study.”
Page 5, line 2: “The same readers evaluated ....etc”. Were they masked to previous results with different methods?
Page 5, line 6: “.... ANOVA techniques...” I suggest deleting “techniques” and in parenthesis write our ANOVA.

Results, Page 5, line 1: “Table 1 shows the complete data of the study.” I would instead suggest: “Table 1 shows the results for the 40 eyes included in the study.”
Page 5, line 8: There is probably a typographical error “expect” written instead of “except”.
Page 5, paragraph 1, line 8: “Methods B and C differ not significantly...”. I suggest: “Methods B and C do not differ significantly...”.

Discussion, Page 6, paragraph 2, line 3: “...but not due to the used method.” The reviewer suggests: “... but not due to the method used.”
Page 6, paragraph 3, second line: “Training the readers before ...etc”. This sentence is not comprehensible
Page 7, paragraph 2, line 8: The word “contemporary” is probably not a good choice – at the same time or “concurrent” might be better
Page 7, paragraph 2, line 9: “Additionally improved effectiveness...etc”. Do the authors mean additionally improved effectiveness must be demonstrated using the new method if it is to replace previous methods? Few sentences on this page are incomprehensible.
Page 8, paragraph 1, line 3: “With this, a large part of GAs ....etc”. After the word “this” the word approach is probably missing.
Page 8, paragraph 2, line 1-4: Delete
Page 8, paragraph 2, line 8: The word “papilla” may be replaced by “optic disc”.
Page 8, paragraph 3, line 2-3: “Consequently, the falsification....etc”. The sentence is difficult to understand. The following lines also appear to include important information but the sentences are difficult to understand.
Page 8, paragraph 3, line 9: The word “imaginable” is probably translation of the German word denkbar – “possible” would be a better choice.

On the whole the chapter Discussion must be shortened – rewritten to a great extent and made more to the point.
Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Discretionary Revisions (which the author can choose to ignore)

**What next?:** Accept after minor essential revisions

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No

**Declaration of competing interests:**

I declare that I have no competing interest.