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## DOCTORAL THESIS REVIEW REPORT

Information on the doctoral thesis
Title Computer-aided diagnosis for prostate cancer using multi-parametric MRI,
Submitted by Mr./ by Ms. Guillaume Lemaitre

<p><b>Global assessment:</b></p> <p>Rate the PhD thesis from 0 to 10: <u>9.0</u></p>
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<p><b>Do you think the thesis can be defended?</b></p> <p><input type="checkbox"/> Without changes <input checked="" type="checkbox"/> With minor changes <input type="checkbox"/> With major changes <input type="checkbox"/> Not in its current version</p>
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<p><b>Do you believe this thesis could be considered for an extraordinary prize?</b> (Only 10% of the PhD theses are awarded with this extraordinary prize)</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
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**REASONED REVIEW** (the reviewer has to justify the global assessment and the proposed changes in the document in terms of the technical aspects and results (theoretical framework, relevance, objectives, methodology, discussion, conclusions, bibliography, worth publishing) and in terms of the formal aspects (presentation, how well it is written, spelling...)).

The thesis describes a solid piece of work which has clearly made a contribution to science and has been published in a range of conferences/journals (or has been submitted for publication).

However, there are a number of issues which need attention, which I will list in the order they appeared in the thesis.

1. p. v: remove "lr".
2. the numbering of the initial pages is incorrect (p. v, vi occur twice and some pages not numbered).
3. not all the papers in the publication list (no page numbers) have contributed to the thesis and as such it is less clear why they were included.
4. p. ix: "US" is used twice!
5. In the Acknowledgement (no page number) "Dr" for both reviewers should be "Prof". Not sure if Jordi is a Prof?
6. p. 6/7: A clear statement on what the thesis/objective is would help.
7. p. 9: first line should start with a capital letter.
8. Chapter 3 could include a paragraph on how the papers were selected.
9. p. 46, figure 3.10: in the caption "to" should be "two" (twice).
10. p.82 (and other places): abbreviations are only needed on first use (not several times in the same paragraph).
11. p. 83: SEN and SPE are used as SE and SP in abbreviations list.
12. p. 85: (a) and (b) should be identified in the caption. The red segments are not very distinctive (54=347!). Also, it might help the reader to look forward and include your own results in these graphs.
13. p. 91: improper reference.
14. p. 92: remove full stop at the end of section heading for 4.1.
15. p. 102: "null" should be "zero".
16. p. 103, figure 5.1: why not model as a bi-modal Gaussian, and include RMS values in the caption.
17. p. 103: why not use a Rayleigh distribution.
18. p. 106: which case was left out (17!=18) and why.
19. p. 107, figure 5.2: which one is better and why.
20. p. 108, figure 5.3: add AUC to the caption or labels.
21. p. 110, figure 5.4: are the difference statistically significant.
22. p. 113, figure 5.6: can you keep the y-axis range on the histograms the same. Also, at the start there is one peak which is clear from the map, but later on this is split into a bi-modal distribution which seems to be lost in the map (or at least not visible), which should be explained, or is it the case that the model estimation is used which only has a single peak, in which case the estimation step should be included in the figure.
23. p. 116: "serie" should be "series".
24. p. 123, table 5.2: the fact that all AUC values are very low (with some below 0.5) should be discussed in more detail.
25. p. 123: the text about table 5.1 could be more detailed on the why (are there outliers that explain some of the effects?).
26. p. 125, figure 5.11: are the differences significant (add to caption).
27. p. 130, figure 6.1: keep the x-axis and y-axis ranges the same for all three graphs.
28. p. 138: why  $k=m=3$ .
29. p. 143, figure 6.5: the low AUC values need to be explained in more detail.
30. p. 145, figure 6.6 (not only with this figure, but with all): what is sufficient/acceptable from a clinical point of view.

31. p. 147: are the improvements significant.
32. p. 149, figure 6.8: not all things improve, and this needs to be discussed in more detail.
33. p. 152, figure 6.10: what is causing the large differences in the results.

In my view these are minor issues and they do not prevent the thesis being defended.