

Artificial intelligence in medical image analysis

Citation for published version (APA):

Ibrahim, A. K. (2022). *Artificial intelligence in medical image analysis: robustness and applications*. [Doctoral Thesis, Maastricht University, Université de Liège]. ProefschriftMaken. <https://doi.org/10.26481/dis.20220330ai>

Document status and date:

Published: 01/01/2022

DOI:

[10.26481/dis.20220330ai](https://doi.org/10.26481/dis.20220330ai)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.umlib.nl/taverne-license

Take down policy

If you believe that this document breaches copyright please contact us at:

repository@maastrichtuniversity.nl

providing details and we will investigate your claim.

Propositions:

1. Radiomics features has the potential to decode biologic information not detectable by humans' eyes "Lambin et al., 2012".
2. "A valid quantitative imaging biomarker must be informative, or sensitive to underlying biology, as well as reproducible and reliable across various image acquisition settings and quantitative methods." "Zhao, 2021"
3. "Knowledge of artificial intelligence methods will become a necessity for radiologists". "Thrall et al., 2018"
4. Changes in a single image acquisition parameter can significantly impact the reproducibility of handcrafted radiomic features. "This Thesis"
5. The sensitivity of handcrafted radiomic features to variations in image acquisition and reconstruction parameters hinder the translation of radiomic signatures into clinical practice. "This thesis"
6. The standardization of image acquisition parameters across different centers is a potential solution for improving the generalizability of radiomic signatures. "This thesis".
7. ComBat harmonization could improve the reproducibility of handcrafted radiomic features depending on the variations in imaging parameters across the data. "This thesis"
8. MaasPenn radiomics score can robustly assess the number of reproducible radiomic features across scans acquired differently. "This thesis".
9. "We are what we repeatedly do. Excellence, then, is not an act, it is a habit" "Will Durant"