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The crucial role of explainability in healthcare AI

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As AI technologies become increasingly embedded in healthcare, the concept of explainability isn't just a technical requirement—it's a bridge to trust between technology and human care. Explainability refers to how AI models articulate their decisions, making their processes transparent and understandable to users, particularly in fields where these decisions can significantly impact well-being and patient outcomes.

Advanced machine learning models, especially in deep learning, are known for their powerful performance in tasks such as image recognition and predictive analytics. However, their "black box" nature often leaves much to be desired in terms of transparency. This is problematic in healthcare, where the stakes include not just accuracy but also ethical considerations such as patient rights and trust.

This collection of papers addresses a critical need: as AI systems grow in complexity, our methods to clarify their decisions must also evolve. Techniques like saliency maps and layer-wise relevance propagation are explored as tools to shed light on these decisions. Particularly notable is the application of class activation maps in radiology, which enhance diagnostic accuracy by highlighting critical areas in medical images that inform AI decisions. Such tools not only validate the AI's outputs but also integrate these technologies with the clinician's expertise, fostering a "human-in-the-loop" collaborative environment.

Moreover, the discussion extends to the importance of explainability for maintaining regulatory compliance and upholding ethical standards. The adoption of AI in healthcare is not just about technological integration but also about ensuring these systems are developed and deployed responsibly.

We emphasize the need for continuous improvement in explainability through feedback mechanisms and alignment with regulatory frameworks, ensuring that AI technologies meet ethical standards and remain accessible to all stakeholders, from policymakers to patients.

In conclusion, advancing AI in healthcare requires a commitment not only to technical excellence but also to ethical integrity and human-centered design. The future of healthcare AI lies in making these systems as understandable as they are powerful, ensuring they augment rather than replace the human elements of care. This approach is fundamentally driven by the principles of Explainable AI, which seeks to demystify AI processes and ensure transparency. This collection of papers provides valuable insights into achieving these goals, guiding both current applications and future developments in Explainable AI.

Financial interests

I confirm that I have received no financial support for the research, authorship, and/or publication of this editorial. I am not affiliated with or financially involved in any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

Non-financial interests

I serve as Head of AI Advocacy at GE Healthcare. This affiliation does not present a conflict of interest in the preparation and submission of this editorial.

Other interests

I declare no other relationships or activities that could appear to have influenced the submitted work.

This statement is accurate as of 17th April 2024. Should my circumstances change in a manner that might be perceived to influence the content or integrity of the work, I will notify the editors of the European Journal of Radiology immediately.

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Jan Beger: Writing – review & editing.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: I, Jan Beger, hereby declare the following potential conflicts of interest

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Jan Beger
GE HealthCare Information Technologies GmbH & Co. KG, Peter-Müller-Str. 24-26, 40468 Düsseldorf, Germany
E-mail address: jan.beger@gehealthcare.com.