# Article information:

Explainable artificial intelligence (XAI) in deep learning-based medical image analysis - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S1361841522001177>

# Article summary:

1. Deep learning-based medical image analysis is often considered a "black box" and there is a growing need for explainable artificial intelligence (XAI) in this field, especially in high-stakes decision making areas such as medicine.

2. XAI techniques are being used to better understand how neural networks make decisions in medical image analysis, and to provide meaningful information to patients about how decisions were rendered.

3. This survey provides an overview of XAI techniques used in deep learning-based medical image analysis, categorized according to a framework of XAI criteria, and discusses future opportunities for XAI in this field.

# Article rating:

Appears strongly imbalanced: The article is written in a biased or one-sided way, and the information it provides is not trustworthy enough to be considered a reliable source. You should consult other sources to find reliable information on the presented issues.

# Article analysis:

该文章是一篇关于解释性人工智能（XAI）在深度学习医学图像分析中的应用的综述。文章介绍了XAI的概念和框架，并对相关论文进行了分类和总结。然而，该文章存在以下问题：

1. 偏见来源：文章没有提及深度学习算法可能存在的偏见和歧视问题，这是一个重要的风险因素。例如，在医疗图像分析中，如果算法对某些人群或特定疾病的诊断结果存在偏差，将会对患者造成严重影响。

2. 片面报道：文章只关注了使用深度学习技术的XAI方法，而没有考虑其他类型的可解释性机器学习方法。这种片面报道可能会导致读者对可解释性机器学习方法的理解不全面。

3. 缺失考虑点：文章没有讨论如何平衡可解释性和准确性之间的权衡。在某些情况下，为了获得更高的准确性，可能需要牺牲一定程度上的可解释性。

4. 主张缺失证据：文章声称XAI可以提高医疗图像分析算法的透明度和公正性，但并未提供足够的证据来支持这一主张。此外，文章也没有探讨XAI可能会对算法性能产生负面影响的风险。

5. 宣传内容：文章过于强调XAI的优点，而忽略了其局限性和风险。这种宣传内容可能会误导读者对XAI的理解和应用。

综上所述，该文章存在一些偏见、片面报道、缺失考虑点和证据不足等问题。在未来的研究中，需要更全面地考虑可解释性机器学习方法的优缺点，并探索如何平衡可解释性和准确性之间的权衡。同时，需要注意到可解释性机器学习方法可能存在的风险，并采取相应的措施来减少这些风险。

# Topics for further research:

* Biases and discrimination in deep learning algorithms
* Other types of explainable machine learning methods
* Balancing interpretability and accuracy in machine learning
* Evidence for the transparency and fairness benefits of XAI
* Risks and limitations of XAI
* Mitigating risks in explainable machine learning methods

# Report location:

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