ISSN: 2320-5407

International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

www.journalijar.com

ISSN NO. 2320-5407

REVIEWER'S REPORT

Manuscript No.: **IJAR- 53538** Date: 26-08-2025

Title: VISUAL CORRESPONDENCE-BASED EXPLANATIONS IMPROVE CONVOLUTIONAL NEURAL NETWORKS FOR CLASIFICATION OF MAMMOGRAMS

In the manuscript title, there is a typographical error:

- **Current**: "VISUAL CORRESPONDENCE-BASED EXPLANATIONS IMPROVE CONVOLUTIONAL NEURAL NETWORKS FOR CLASIFICATION OF MAMMOGRAMS"
- **Corrected**: "VISUAL CORRESPONDENCE-BASED EXPLANATIONS IMPROVE CONVOLUTIONAL NEURAL NETWORKS FOR CLASSIFICATION OF MAMMOGRAMS"

Please correct the spelling of **"classification"** in the title to maintain accuracy and professionalism.

Recommendation:
Accept as it is **.....**
Accept after minor revision ...✓.....
Accept after major revision.....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity		✓		
Significance		✓		

Reviewer Name: **Sudhanshu Sekhar Tripathy** **Date:** 26-08-2025

Reviewer's Comment for Publication.

(*To be published with the manuscript in the journal*)

The reviewer is requested to provide a brief comment (3-4 lines) highlighting the significance, strengths, or key insights of the manuscript. This comment will be Displayed in the journal publication alongside with the reviewer's name.

Reviewer's Comment for Publication

The paper proposes a novel **Visual Correspondence-Based Explanation (EMD-Corr)** framework to enhance the interpretability and accuracy of convolutional neural networks for mammogram classification. By combining ResNet-18, kNN, and patch-level similarity re-ranking, the study addresses both classification performance and explainability, which are highly important in medical AI. The work is timely and technically strong, but requires **minor revisions** to improve clarity in reporting and presentation.

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Detailed Reviewer's Report

Recommendation: **Accept after Minor revision.**

Comments & Suggestions for Improvement

1. Scope & Relevance:

- The study is highly relevant, tackling explainable AI (XAI) in healthcare imaging, a critical area for trust and adoption in medical practice.
- Using mammograms from the Vietnam National Cancer Hospital adds clinical importance and originality.

2. Structure & Technical Presentation:

- The paper is well-structured (Introduction, Methods, Experiments, Evaluation, Conclusion).
- Figures are informative, but the **framework flowchart** of EMD-Corr should be emphasized with clearer labels for better understanding.
- Tables should include significance testing or confidence intervals to strengthen claims.

3. Experimental / Methodological Details:

- Dataset of **15,040 mammograms** with detailed train/validation/test splits is clearly described.
- Classifiers (ResNet-18, kNN, EMD-Corr) are well explained, but Hyperparameter (e.g., learning rate, epochs, optimization settings for ResNet-18) should be stated explicitly.
- The choice of **top-5 patch pairs and k=20 neighbors** is justified but could benefit from a short ablation analysis.
- IoU-based evaluation for tumor localization is a strong addition, though results could be expanded with more clinical interpretation.

4. References & Citations:

- References are comprehensive and include both classical works and recent studies (2020–2024).
- Ensure consistent formatting (some duplicate references appear, e.g., Casalino et al., 2024 listed twice).

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5. Language & Style:

- Overall, the manuscript is written in clear academic English.
- Minor grammatical corrections and reduction of redundancy in the results section are suggested.
- Technical terms (e.g., "patch pairs," "IoU") should be briefly defined where first mentioned.

6. Key Strengths:

- Addresses both **accuracy and interpretability** of CNNs in mammogram classification.
- Robust dataset and evaluation, including localization via IoU.
- Demonstrates EMD-Corr's ability to improve classification over ResNet-18 and provide explainable outputs.

7. Areas for Improvement:

- Add a **framework/flowchart** summarizing the overall architecture.
- Report key Hyperparameter for reproducibility.
- Consolidate references and remove duplicates.
- Provide a clearer discussion on clinical implications and limitations (e.g., patch granularity vs. tumor boundaries).

Final Feedback to Author

This is a strong paper that makes a valuable contribution to explainable AI in medical imaging. With **minor revisions**—including clearer presentation of the framework, more detail on training parameters, reference cleanup, and a concise discussion of limitations—the manuscript will be ready for publication.