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Peer Review

Review of: "Development of a Lung Cancer Detection System Using Residual Network 50 on Computed Tomography Scans"

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This manuscript presents a valuable and timely contribution in the area of AI-driven medical image analysis for lung cancer detection using the ResNet-50 architecture on CT scan images. The study addresses an important healthcare challenge where early diagnosis can significantly improve patient outcomes. The topic is highly relevant to current research trends in deep learning and computer-aided diagnosis.

One of the major strengths of the paper is the effective use of a well-established deep learning framework such as ResNet-50 for feature extraction and classification. The methodology appears technically sound, and the overall structure of the manuscript is clear and organized. The work demonstrates good research effort and practical relevance in the domain of intelligent healthcare systems.

The manuscript also shows strong potential for real-world clinical support applications, particularly in assisting radiologists with faster and more accurate screening processes. The experimental outcomes are encouraging and indicate that the proposed approach can contribute meaningfully to automated lung cancer detection systems.

I particularly appreciate:

- The selection of a robust deep learning architecture.
- The relevance of the problem statement and motivation.
- The promising performance of the proposed model.
- The clear flow of presentation from introduction to results.
- The potential societal and clinical impact of the work.

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While the manuscript is already strong, a few minor improvements could further enhance its quality and reproducibility:

1. It would be beneficial to provide additional implementation details such as learning rate, optimizer used, batch size, number of epochs, train-validation-test split ratio, image resizing methods, normalization techniques, and any data augmentation strategies applied. Including these details would help improve reproducibility and allow other researchers to validate and extend the proposed work more effectively.
2. Including evaluation metrics such as sensitivity, specificity, and ROC-AUC would further strengthen the clinical relevance of the study. In medical diagnosis applications, these metrics provide deeper insight into model performance beyond overall accuracy. Sensitivity helps evaluate the model's ability to correctly identify lung cancer cases, which is particularly important for minimizing false negatives. Specificity reflects how effectively the system avoids false alarms in healthy cases, while ROC-AUC provides a more comprehensive understanding of classification performance across different threshold settings.
3. A brief discussion on future clinical deployment, model interpretability, or explainability techniques such as Grad-CAM could further enhance the practical impact and trustworthiness of the proposed system.

Overall, this is a well-motivated and technically meaningful study with strong application potential in medical imaging and AI-based healthcare diagnostics. The manuscript demonstrates promising research quality and practical significance. I strongly recommend this paper for publication after minor revisions and appreciate the authors for their valuable contribution to this important research area.

Declarations

Potential competing interests: No potential competing interests to declare.