

Submission Summary

Conference Name

IEEE Guwahati Subsection Conference 2026

Paper ID

779

Paper Title

A Lightweight and Explainable AI System for Lung Nodule Screening on Edge Devices

Abstract

Lung cancer screening via CT remains difficult in rural and low-resource areas due to limited radiologist access and unreliable connectivity. We present a lightweight, explainable AI system for automated lung nodule screening on edge devices. Our end-to-end pipeline performs detection, segmentation, and malignancy risk estimation using optimized deep learning models, requiring minimal compute. Visual Explainability through masks and saliency maps enhances clinical trust. The modular, asynchronous design enables offline operation and generates bilingual reports for both clinicians and patients. Evaluated on public datasets, our system delivers competitive accuracy with low latency, highlighting its potential for scalable deployment in underserved regions.

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Authors

Kowshik Padala (Amrita Vishwa Vidyapeetham)

<am.en.u4cse22245@am.students.amrita.edu>

Dinesh Chappidi (Amrita Vishwa Vidyapeetham)

<am.en.u4cse22215@am.students.amrita.edu>

Rahul Thota (Amrita Vishwa Vidyapeetham) <am.en.u4cse22257@am.students.amrita.edu>

Teja Sai Sathwik Peruri (Amrita Vishwa Vidyapeetham)

<am.en.u4cse22271@am.students.amrita.edu>

Simi Surendran (Amrita Vishwa Vidyapeetham) <simisurendran@am.amrita.edu>

Primary Subject Area

Signal and Image Processing, Bio-Medical, Machine Learning, AI, Data Science and Architecture

Submission Files

A_Lightweight_and_Explainable_AI_System.pdf (651.5 Kb, 1/31/2026, 10:12:52 PM)

Submission Questions Response

1. Author Consent

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7. Double Blind Review

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8. Novelty

Please specify the main contributions of the paper

We introduce a deployable AI pipeline for lung nodule screening that unifies lightweight 3D analysis, visual explainability, and bilingual reporting optimized for edge inference in rural, connectivity-constrained settings. Our modular design supports asynchronous workflows and clinician-patient collaboration, offering a practical path toward scalable screening in underserved regions.