**Reviewer 5 - Question no - 4**

**Whether the features are derived from binary or gray-scale images? Can 3D images be used? If so, why not in this process of work?**

In our research, we used 2D cross-sectional slices extracted from CT scans for the purpose of lung nodule detection and classification.

The choice to use 2D images was driven by the consideration of computational complexity. Analyzing 3D volumes would require significantly greater computational resources and time, as it involves processing a larger dataset and often necessitates more complex algorithms.

Furthermore, 2D images are commonly used in machine learning, particularly in the context of deep learning with Convolutional Neural Networks (CNNs). Traditional machine learning models like logistic regression, decision trees, random forests, SVM, and KNN are generally more appropriate for structured data and may require image flattening to 1D for compatibility.

The dataset used in this research, the "IQ-OTH/NCCD lung cancer dataset," was collected over three months in fall 2019 at the Iraq-Oncology Teaching Hospital/National Center for Cancer Diseases (IQ-OTH/NCCD). It includes CT scans of patients diagnosed with lung cancer in different stages, as well as healthy subjects. The dataset is diverse, covering various demographics and backgrounds, including gender, age, educational attainment, area of residence, and occupation. The CT scans were originally collected in DICOM format using a Siemens SOMATOM scanner with specific imaging parameters.

**References:**

Alyasri, Hamdalla; AL-Huseiny, Muayed (2021), "The IQ-OTHNCCD lung cancer dataset," Mendeley Data, Version 2, doi: 10.17632/bhmdr45bh2.2