Automatic Lung Cancer Detection and Classification (ALCDC) System Using CNN

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Abstract: *Lung cancer remains one of the most prevalent and deadliest forms of cancer worldwide. Early and accurate diagnosis is pivotal for improving patient outcomes. This paper presents the development and evaluation of an Automatic Lung Cancer Detection and Classification (ALCDC) system based on Convolutional Neural Networks (CNNs). The ALCDC system leverages state-of-the-art deep learning techniques to automatically detect lung cancer from medical imaging data, thereby aiding radiologists in early diagnosis and classification of lung malignancies.*

Our approach involves the construction of a comprehensive dataset comprising chest X-rays and computed tomography (CT) scans from diverse sources and patient populations. A custom-designed CNN architecture is then employed to process these images, extracting meaningful features for accurate lung cancer detection and classification. We evaluate the ALCDC system on a large-scale dataset, demonstrating its robustness and reliability across various cancer stages and lesion types. Our results show promising levels of sensitivity, specificity, and overall accuracy, suggesting its potential as a valuable tool in clinical practice.

This paper contributes to the ongoing efforts in leveraging artificial intelligence for early cancer detection and classification, particularly in the domain of lung cancer. The ALCDC system not only exhibits high diagnostic performance but also offers the advantage of automating a labour-intensive task, thereby reducing the burden on healthcare professionals and potentially enabling earlier intervention for patients. As lung cancer remains a global health challenge, the development of such AI-driven systems holds promise in improving patient outcomes and reducing mortality rates.

Keywords: Lung cancer, automatic detection, classification, CNN, deep learning, medical imaging, early diagnosis, radiology, artificial intelligence, healthcare, patient outcomes etc.

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