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The Lung Imaging Database Consortium: Creating a Resource for the Image Processing Research Community

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Abstract:

Purpose: To develop an image database as a research resource for the development, training, and evaluation of Computer Assisted Diagnostic (CAD) methods for lung cancer detection and diagnosis using helical computed tomography (CT).

Methods and Materials: From five NCI-funded institutions, representative cases of helical CT images containing lung nodules selected from lung cancer screening studies or diagnostic studies will be collected. Technical information about the scanner and scanning parameters used to acquire the image data will be obtained from DICOM data. The spatial location of lesions (nodules, ground glass opacities, etc.) will be determined by expert radiologists. Spatial truth about lesion boundaries will be obtained by having contouring performed on lesions above a certain minimum size. Pathological truth on lesions, for which tissue samples are available, will be determined by a panel of pathologists. Therefore, the database should permit performance results of CAD methods for detection and classification of lung cancer to be correlated with spatial and pathological ground truth. The database is to be web accessible by the imaging research community in a timely manner. All patient related information will be de-identified.

Results: Inclusion criteria have been developed to describe the CT scans that will be collected as well as the range of abnormalities, normal scans and underlying companion diseases that will be allowed. Processes are being developed for radiologist and pathologist review of cases, for data elements to be collected and entered into the database and to make the database web-accessible and allow flexible querying.

Conclusion: The LIDC is creating a resource for the image processing community that supports the development and subsequent quantitative evaluation of their CAD systems' performance in lung cancer detection and diagnosis. We believe that the development of this infrastructure resource will stimulate research in CAD methods for lung cancer.