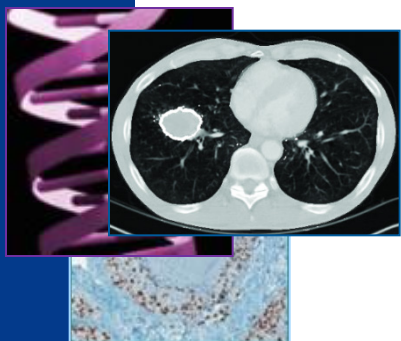


Texture Feature Analysis of Low-Dose CT Images for Pulmonary Nodule Diagnosis



Despite a significant 20% reduction in mortality observed with the use of low-dose CT scans for diagnosis of pulmonary nodules, it's use in the clinic has been prohibited by low sensitivity when analyzed with traditional software. Our technology, an algorithm that analyzes texture features in low-dose CT scans, significantly increases clinical accuracy, sensitivity and specificity, when used in combination with traditional shape feature analysis. Incorporation of our software in the clinic can improve diagnostic accuracy, reduce unnecessary diagnostic tests, and improve lung cancer mortality rates.

COMMERCIAL OPPORTUNITY

- Pulmonary nodules are the primary precursor to the development of lung cancer, the leading cause of cancer related deaths in the United States (~160,000/year). Pulmonary nodules are found in approximately 150,000 patients per year during routine scans for other ailments.
- The probability of malignancy increases with pulmonary nodule size: 1% of small (4-7 mm) and 18% of intermediate (8-20 mm) nodules will be diagnosed as malignant. Clinical guidelines suggest up to 3 follow up CT scans over the course of 2 years for patients with pulmonary nodules over 4 mm in size to monitor growth for diagnosis
- National Lung Screening Trial results indicate a 20% reduction in mortality with the use of low-dose CT scans versus traditional CT scans; however, sensitivity of low-dose CT screening has prohibited its use clinically. Current computer aided diagnosis systems extract only shape features, but fail to incorporate texture features, which improves accuracy, sensitivity and specificity leading to a more accurate diagnosis.
- Our software algorithm incorporates both texture feature analysis and shape feature analysis to significantly increase the accuracy of diagnosing pulmonary enabling the use of low-dose CT scans, significantly improving patient mortality rates.

TECHNOLOGY

Current technology for the use of diagnosing pulmonary nodules using low-dose CT scans has an accuracy of 56.4-82.5% and sensitivity of 85%. Our technology incorporates a "Nearest Neighbor" algorithm to quantify and analyze texture features in low-dose CT scans, along with shape features, to improve clinical accuracy significantly to 87.88% from standard analysis techniques. Similarly, clinical sensitivity rose to 78.57% and specificity soared to 94.74% when our algorithm was used in combination with standard analysis techniques.

PUBLICATION/PATENT

- H. Krewer, et al. "Effect of texture features in computer aided diagnosis of pulmonary nodules in Low-Dose Computed Tomography," *IEEE International Conference on Systems, Man and Cybernetics (SMC 2013)*, Manchester, UK, 10/2013
- Provisional patent application filed on 10/12/13 for Drs. Gillies, Goldgof, and Hall

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LICENSING OPPORTUNITY



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