

Computer-Assisted Detection of Lung Nodules

Researchers at the University of South Florida have developed a computer-aided diagnostic (CAD) method and apparatus for the analysis of digital x-ray images for the detection of lung nodules.

Lung nodule detection using conventional chest x-ray film is subjective and often yields imprecise results requiring x-ray CT as a follow-up diagnostic. Although x-ray CT has the advantage of sensitivity, it is usually very time-consuming. Often, problems are created when images overlap and objects of different sizes are present in the x-ray CT.

A computer-assisted diagnostic (CAD) solves the problems of currently-available techniques. The CAD system offers speed and accuracy as well as an objective analysis for improved diagnostic procedures.

USF researchers have proposed the use of CAD method and created an apparatus that enhances detection, as well as classification of suspicious regions in digital x-ray images, with particular emphasis on lung nodule detection using chest x-ray images.

The designed and optimized methods and CAD modules permit enhancement and preservation of image details. In addition, an important feature of the design is a 1.5 D circular pattern filter and a spatial and multiscale analysis to resolve the problem presented by overlapped objects and to detect objects of different sizes. Other advantageous features of this technology are high sensitivity and speed. Together, the methods and the apparatus provide high quality images and minimize the rate of false-positive and false-negative diagnosis.

ADVANTAGES:

- Offers fast results
- Enables early diagnosis
- Offers objective and highly accurate results
- Highly sensitive and specific
- Minimizes number of false readings
- Great tool for "second opinion" strategy

Enables Early and Accurate Diagnosis



Lung tissue showing a large fibrocaseous nodule

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