**Massive Training Artificial Neural Network for Reduction of False Positives in**

**Computerized Detection of Lung Nodules in Low-Dose CT**

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Lung cancer continues to rank as the leading cause of cancer death among Americans. Screening programs for lung cancer have been attempted with CT (Computed Tomography) in some countries. In the lung cancer screening, radiologists may miss some cancers during interpretation of CT images. Therefore, a computer-aided diagnostic (CAD) system for lung nodule detection in CT has been investigated as a useful tool for lung cancer screening. A major problem of a CAD system is, however, a large number of false positives generated by the system. Therefore, it is important to reduce the number of false positives as much as possible. We developed a CAD system for lung nodule detection in CT with the lowest false positive rate 0.08 per section. The key for this achievement was a new pattern classification technology called massive training artificial neural network (MTANN), which is based on a model of the human brain. By use of the MTANN, we were able to reduce the number of false positives to 7% of the current level. The MTANN has a potential to improve the performance of CAD systems for various diagnoses such as lung cancers in chest radiography, breast cancers in mammography, risks of a heart attack in coronary angiography, and polyps in colonography.