A Brief Note on CADD Role in Diagnostics

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Introduction

Computer-aided diagnosis (CAD) has become a hot topic in medical imaging and diagnostic radiology research. The rationale and concept of early development of CAD methods as well as the current status and future possibilities of CAD in a PACS environment. Radiologists use the computer result as a "second opinion" before making final judgments with CAD. CAD is a paradigm that considers both the roles of physicians and computers equally, whereas automated computer diagnosis is solely dependent on computer algorithms. Computer performance in CAD does not have to be equivalent to or better than that of physicians, but it should be used in conjunction with physicians. In reality, CAD could be used for a massive amount of people.

Even before paired with another CAD scheme for PA chest images, a CAD scheme that uses lateral chest images has the potential to increase overall performance in the detection of lung nodules. Because vertebral fractures may be reliably diagnosed by computer on lateral chest radiographs, the use of CAD would increase radiologists' accuracy in detecting vertebral fractures, allowing for early diagnosis of osteoporosis. A CAD system for supporting radiologists in the diagnosis of cerebral aneurysms has been created in MRA. Using temporal subtraction pictures on sequential bone scan images, a CAD system for detecting interval changes has been devised.

Many CAD systems could be designed and applied as a component of PACS in the future. The computerised detection of lung nodules, interstitial opacities, cardiomegaly, vertebral fractures, and interval changes in chest radiographs, for example, as well as the computerised classification of benign and malignant nodules and the differential diagnosis of interstitial lung diseases, may be included in the kit for chest CAD. When a reliable and useful method for quantifying the similarity of a pair of images for visual comparison by radiologists has been developed, it will be possible to search for and retrieve images (or lesions) with known pathology, which would be very similar to a new unknown case, from PACS to aid in differential diagnosis.

The discipline of computer-aided diagnosis (CAD), which includes computer-aided detection and quantification, is well-established and quickly expanding. However, most radiologists do not employ CAD on a regular basis in their daily practice. The fundamentals of CAD for lesion detection and quantification and provide examples to demonstrate the state-of-the-art. The following are the prerequisites for CAD that the, radiologists have: enough performance, no increase in reading time, easy workflow integration, regulatory approval, and cost efficiency. For many CAD systems, performance is still a major constraint. Novel applications of CAD, such as expanding the usual paradigm of displaying markers for a second look, may be the key to efficiently utilizing the technology.

However, software upgrades are also required. Lodwick et al reported the first results on the classification of pulmonary lesions on chest radiographs in Radiology in 1963, and in 1966, he coined the term "computer-aided diagnosis" for the first time in the scientific literature. Despite the fact that today's computers are 30 million times faster than those employed by Lodwick, finding improved software algorithms for the detection and categorization of pulmonary nodules on chest radiographs is still a hot topic of research. It's becoming more difficult to improve CAD algorithms, and faster computers give developers more options to play with. In comparison to prior decades, the number of publications connected to CAD has grown tremendously over the years in this decade.

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Conflict of Interest Statement

Authors declare they have no conflict of interest with this manuscript.