


## Chapter 2

# Study of the Current Trends of CAD (Computer–Aided Detection) in Modern Medical Imaging

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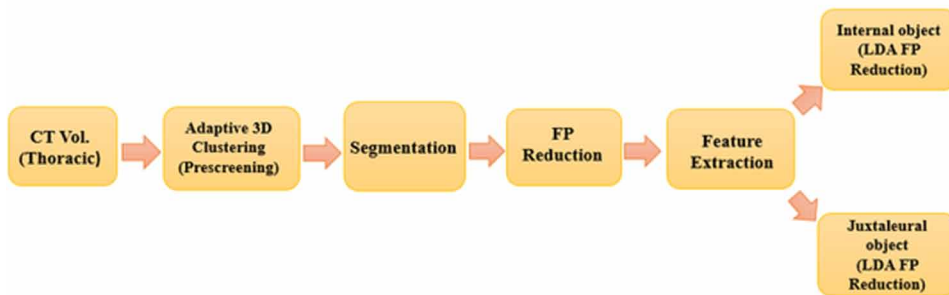
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### ABSTRACT

*CAD or computer-aided detection is a valuable performance for exactly understanding medical images. Also, it has a worldwide business prospect. The present features concerning the four sub-steps—image pre-processing, segmentation, feature extraction, and classification—and the upcoming possibility of these systems in modern medical imaging have been studied in this chapter. Several researchers have highlighted the requirement for interaction between medical experts and engineers for effective improvement of these systems, and the present work is away on that track. The technological features of the above four steps in four imaging processes like magnetic resonance imaging (MRI), mammography, computed tomography (CT), and bone scintigraphy applied in the diagnosis of several acute diseases have been studied with a medical background. This chapter reviews these technological features with an observation to search the prospects to researchers along with the healthcare industry to offer reasonable medicinal facilities with approachability in even faraway localities.*

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*Figure 1. The modules of CAD system.*



## INTRODUCTION

In recent times, CAD or Computer-Aided Detection has become an important area of the modern clinical practice for the detection of tumors, renal stone, breast cancer, etc. (Bayer et al., 2020) (Hricak et al., 2016, El Naqa et al., 2021, Movik et al., 2017). This appears to specify that computer-aided detection is opening to be useful commonly in the recognition and difference identification of several dissimilar varieties of defects in medical images found in different analyses by practice of dissimilar imaging methods. Figure.1 shows the modules of the CAD system. CAD has become one of the core research issues in diagnostic radiology (Alhasan et al., 2021, Gao et al., 2018, Petranović Ovčariček et al., 2021, Morris et al., 2022). Though in 1960, initial efforts at the computerized investigation of medical images (Fan et al., 2019, Schultz et al., 2020, Watt., 2014) were prepared, and in 1980, a serious and methodical analysis of CAD was initiated with an essential modification in the theory for application of the computer output, from computerized diagnosis to CAD. With the help of computer-aided detection, radiologists use the report as a “2nd opinion” and make the ultimate decisions. Computer-Aided Detection is a conception recognized by considering similarly the parts of doctors and computers (Mastrocola et al., 2020, Park et al., 2016). A huge number of computer-aided detection systems consume been engaged in supporting doctors in the initial recognition of breast cancers on mammograms (Le et al., 2019, Gardezi et al., 2019).

A CAD system that creates usage of lateral chest images has the probable to recover the whole performance in the recognition of lung nodules when joined with another CAD system for chest-PA (Posterior-Anterior) images (Dzefi-Tetty et al., 2020, Thakur et al., 2019, Fraioli et al., 2010). For the reason that vertebral fractures can be noticed consistently by a computer on lateral chest radiographs, radiologists' accuracy in the identification of vertebral fractures would be enhanced by the practice of CAD, and therefore the initial diagnosis of osteoporosis would become possible

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