



## Diagnostic quality assessment of medical images: Challenges and trends

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Résumé en anglais  
With medical imaging technologies growth, the question of their assessment on the impact and benefit on patient care is rising. Development and design of those medical imaging technologies should take into account the concept of image quality as it might impact the ability of practitioners while they are using image information. Towards that goal, one should consider several human factors involved in image analysis and interpretation, e.g. image perception issues, decision process, image analysis pipeline (detection, localization, characterization...). While many efforts have been dedicated to objectively assess the value of imaging system in terms of ideal decision process, new trends have recently emerged to deal with human observer performances. This task effort is huge considering the variability of imaging acquisition methods and the possible pathologies. This paper proposes a survey of some key issues and results associated to this effort. We first outline the wide range of medical images with their own specific features. Next, we review the main methodologies to evaluate diagnostic quality of medical images from subjective assessment including ROC analysis, and diagnostic criteria quality analysis, to objective assessment including metrics based on the HVS, and model observers. At last, we present another evaluation method: eye-tracking studies to gain basic understanding of the visual search and decision-making process.

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